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Sierra Club

To explore, enjoy, and preserve the Sierra Nevada and other scenic resources of the United States and its forests, waters, wildlife, and wilderness; to undertake and to publish scientific, literary, and educational studies concerning them; to educate the people with regard to the national and state forests, parks, monuments, and other natural resources of especial scenic beauty and to enlist public interest and coöperation in protecting them.

JOHN MUIR, President 1892 to 1914

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FORTY PAGES OF PLATES

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DECEMBER 1956

NUMBER 10

Scenic Resources for the Future

By DAVID R. BROWER

WHY CAN'T Johnny read? Because he's only three, our youngest. But, he walks quite well for his age. He covered nine of our ten miles of the trail into the Glacier Peak country last summer on his first wilderness trip. That was far enough. Very few miles more, and he would have walked out the other side; none of us wanted to get back to civilization that soon.

John is not much different from other children you know who are his age and who, before you know it, will be voting for president for their first time. The very year they do, this nation will celebrate its two hundredth birthday.

Which brings me to the point. How beautiful will America be then?

And when John is about as old as his father is now—which will happen, God willing, much sooner than he thinks—he'll be able to bid one millennium good-bye and watch the year 2,000 come in. In an understandable way, that puts me there too. It gets me to wondering what wilderness will be there for him to walk his youngest into; what wild creatures and natural beauty in a world otherwise filled with artifacts; what choice of scenic experience for a whole crowded land, hardly two generations away.

There aren't many places left where we, ourselves, can choose whether to exploit or leave wild. Although the budget of natural things may have looked unlimited to grandfather, we know it is a finite budget. Wilderness is a fragile thing. Man can break it but not make it. And we are quite

capable, in our own time, of breaking it all—quite capable of using up all the choices America will ever have between saving and spending what is left of its unmarred natural heritage.

Only our own self-restraint, in a way, can assure Johnny and his contemporaries more than a world of ersatz scenery. A Reuters dispatch of last May suggests how close that world is. The dispatch tells us that a Paris clinic has found a synthetic equivalent for a month's rest in the mountains.

"Ten short visits to a clinic here will give tired Parisians treatment by oxygen equivalent to a month's rest cure in the mountains, the newly opened Paris oxygen center claims.

"The treatment in rooms decorated with colors to 'suit the condition of the patient' costs 15,000 francs (\$37) and lasts 25 minutes for each of the ten visits.

"The center has red rooms reserved for patients who seek the tonic of mountain treatments. Green rooms, said a center official, suggest the quiet of a rest in the country. And blue rooms provide the right atmosphere for the highly strung who would like to take it easy at the beach.

"Each room has artificial windows looking onto giant photographs of soothing land and seascapes and the temperature is regulated with the oxygen to give an impression ranging from balmy days in sunny meadows to invigorating mountain climes. Patients take the oxygen in transparent nylon tents."

I know of no one who is willing to exchange wildness for a synthetic, or who would consciously make decisions today that would leave his children only a scenic nylon tent in a Paris clinic, or the two-toned, streamlined equivalent we could expect in the domestic market places. Yet it takes no more than two or three moments of quiet contemplation to demonstrate how fast we are moving in this direction.

While I write, at an elevation of 1,000 feet in the Berkeley hills, my eyes are smarting. We built here for the view of San Francisco Bay and its amazing setting. But today there is no beautiful view; there is hideous smog, a sea of it around us. "It can't happen here," we were saying just three years ago. Well here it is. And on the land around us, where just two generations ago a man could be born "on a farm in the North Berkeley hills," there isn't room to plant another iris corm when I separate those that are now stifled by crowding. For all this, our planners talk breezily, even happily, of an ultimate population of seventeen million people around the Bay. To enjoy the view? To breathe the clean sea air? To stroll in the park on an autumn afternoon? What park?

"The only thing necessary for the triumph of evil," we are told, "is for good men to do nothing." Some good men are doing very well; those of them who are in the business of transforming natural resources into commodities for the commercial world are planning ahead admirably. The forest products industries and the Forest Service are looking hard at the year 2,000 and to meet that year's needs are rapidly adding to our vast tree-crop lands by converting the last of our virgin forests. The agencies that develop water and hydro-power are building the dams now that will meet the next century's requirements and are creating reservoirs where the bottom lands were, and the living space for wildlife and recreation. Highway engineers, in long-range plans, are trying desperately to pave pasture fast enough for the new hordes of horses our automotive engineers are placing under millions of hoods—sixty-five million hoods this year, or twice as many as were on the road a decade ago.

The conservationist, however—and by *conservationist* I mean the man (or part of him) concerned with what natural resources do for his spirit, not his bank balance—is not doing so well in making certain that civilization will retain the wild islands that are essential in his tamed world. In the race to the future it seems as if we are riding a detached little red caboose, destined never quite to catch up, resigned to arriving at that future only to find that all the land is already staked out for practicable utilitarian progressive realistic commercial purposes.

We need to get out of that caboose and ride the engine instead. Or at the very least to get everybody to ride the caboose and arrive at the same time. And there's a way to do it.

Early in 1956 the Sierra Club Board of Directors proposed a Scenic Resources Review—a full-scale conservationist effort to look ahead as far as the commodity producers are looking. To summarize a summary of it, the Review would provide that public and private agencies combine speedily to find what scenic resources are still left, to make an estimate of the future's need for them, and to devise ways of protecting them in time. The term *scenic resources* is only a convenient short cut; for our purposes it covers local, state, and national parks, appealing wilderness wherever it is, the wildlife that brings vitality to these scenes, and the vitality, resourcefulness, and creative ability that people regain when they get off the pavement and onto the world. A medium-length definition would be the resources of parks, wilderness, and wildlife and the recreation derived from them. And now let's shorten it to the SRR.

The SRR affects you directly, and poignantly affects anyone you know who is Johnny's age. It relates to what we and his contemporaries will see

out of our windows and through our windshields. It has major bearing on what we and he will be able to do on those days when we want to see less of the world as man has remade it and more of it as God made it in the first place. The SRR has meaning in the sights, sounds, smells, tastes, and feelings we ought to be able to know when we head for a far, clean horizon to come to our senses, or to let them come to us.

So much for the general import. What are the specific steps of the inquiry? Let's take them one by one.

1. WHAT DO WE HAVE?

The country's most distant horizons are now less than eight hours apart and the time is shrinking. What scenic resources lie between? We need an inventory. We don't have it.

We already know, of course, where our present national and local parks are, but we don't know how many people the key areas of a park can withstand without defeating the esthetic purposes for which the park was set aside. Nor do we know what areas of park caliber exist which may be set aside to meet the presumably growing need.

We already know what wilderness and wild areas have been designated in national forests, but we don't know their carrying capacity in people. We don't know what wild lands have been designated, or could be designated, in parks, wildlife refuges, on Indian lands, on state lands, or on the public domain in general. For that matter, no compilation exists of where our roadless areas are in this country.

One of the most important categories of scenic resources does not even have a name. It is unlike parks, where you can drive but don't hunt, and unlike wilderness, where you may hunt but not drive; for in this category you may drive and hunt. Its scenic and recreational importance is great, but will be all but obliterated if exploitation of commodity resources is permitted. The Forest Service has designated many of these places as recreation areas; people camp and ski there, or visit resorts and lease summer homesites. But there are many such places on national forests which are not so designated and none of them has strong protection against incompatible uses. We don't know how many there are, or how many people they could accommodate, or how many similar areas there are outside the jurisdiction of the Forest Service or National Park Service.

This is not the place to spell out scenic-resource land classifications, but merely to point out the need of their being spelled out. Each of us knows what kind of scenic place he likes to go to when there's a chance; in simplest terms, then, the question on a national scale is, what places

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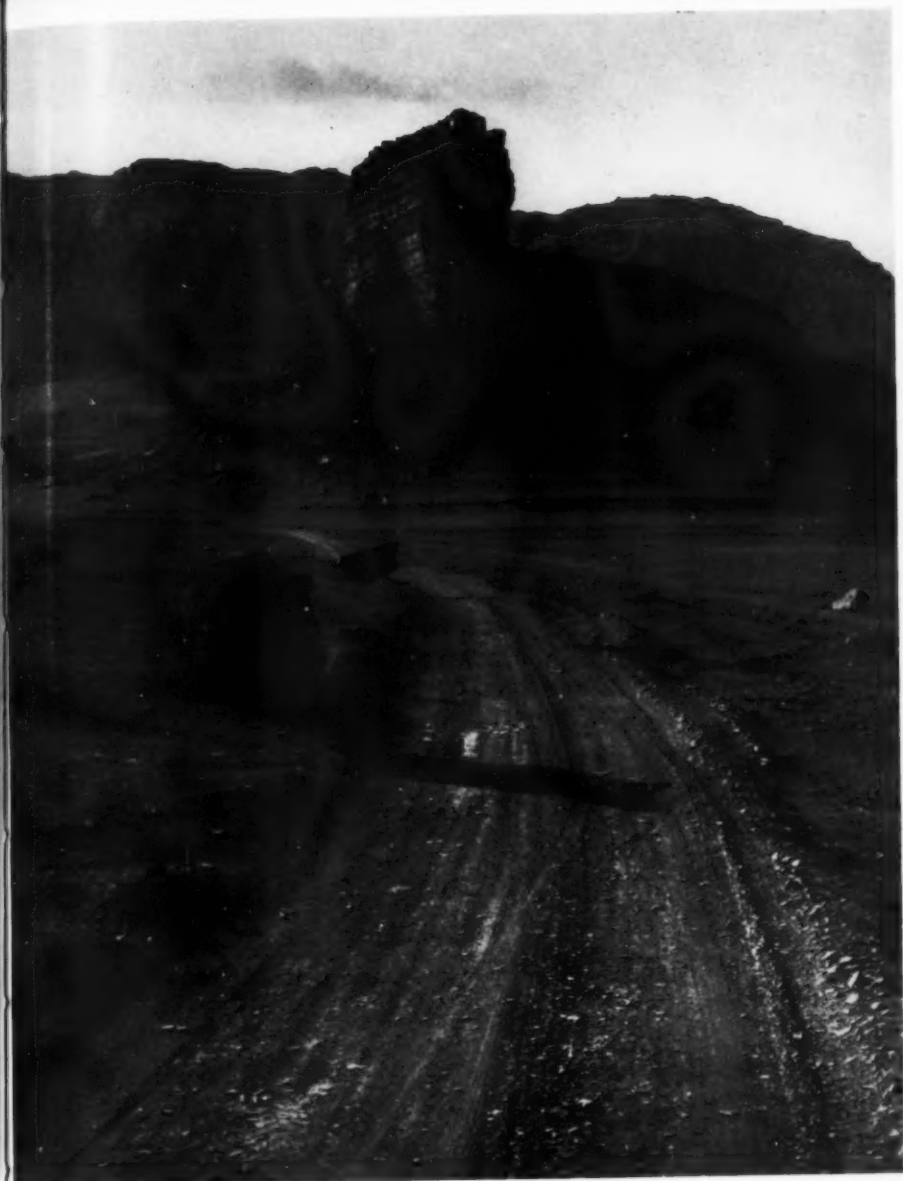
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☪ When your spirit cries for peace, come . . .

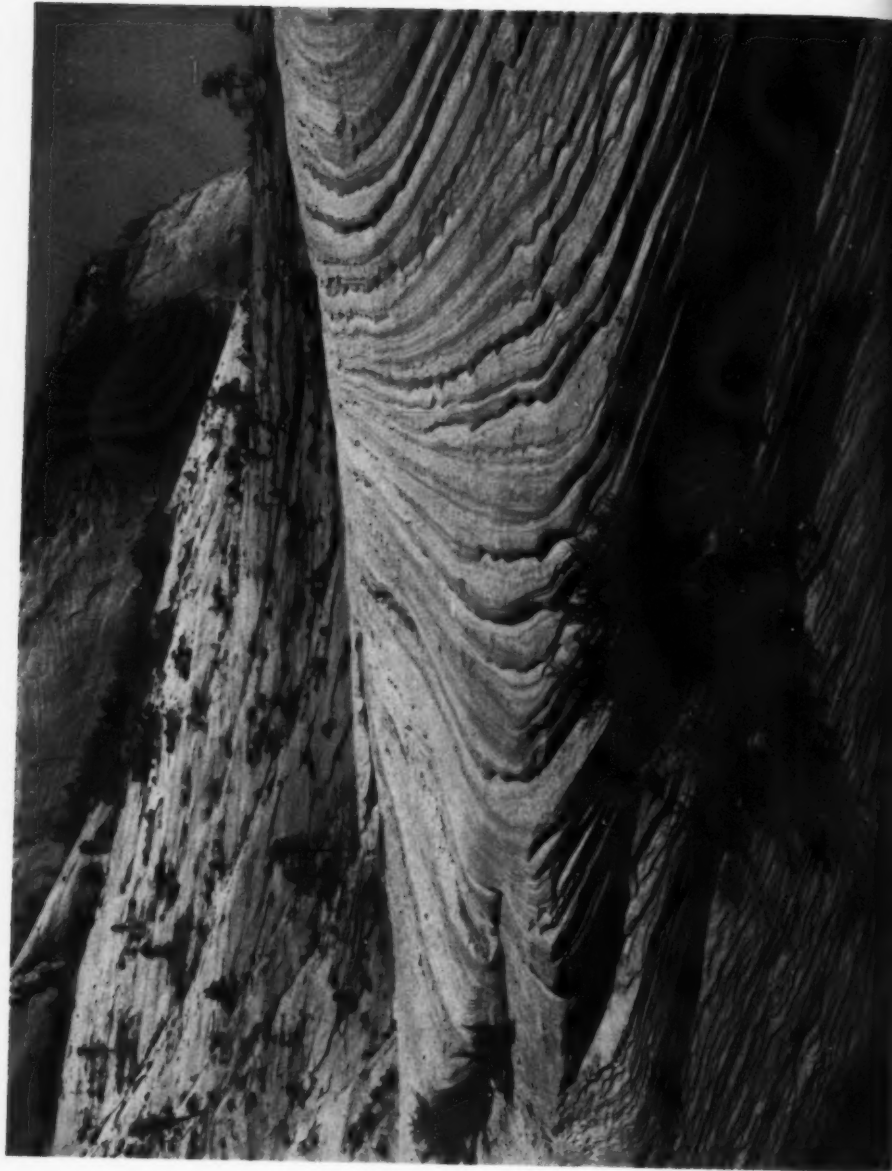


to a world of canyons...

deep in
an old
land...



feel the exultation
of high plateaus . . .



the strength
of moving waters .





the
simplicity
of sand
and grass.



Come into the
northern ranges . . .



know their
soaring lines
and massive volumes.





the heated waters
of the earth...

the cold
still lakes . . .





... and the silence of growth.

PHOTOGRAPHS BY PHILIP HYDE

1. Road to Lee's Ferry 2. Mormon Crossing, Glen Canyon 3. Grand Canyon at Tapeats Creek
4. East side of Zion 5. Colorado River at Granite Creek 6. In Grand Canyon
7. Alaska Basin, Tetons 8. Death Canyon Bench, Tetons 9. McDonald Valley, Glacier Park
10. Jupiter Terrace, Yellowstone 11. Iceberg Lake, Glacier Park 12. Hoh rain forest, Olympic

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like this are there, where are they, and how many people can use them without spoiling them?

2. HOW MUCH SPACE WILL WE NEED?

Assuming that the future will want freedom; assuming that freedom is meaningless without freedom of choice; and assuming further that tranquility should always be an available choice, somewhere, some time, however briefly—assuming all this, what will our needs be for scenic open space by the year 2,000? This is an arbitrary choice of year—it's just the well-rounded year that Johnny should see come in—but it is well within our ken. Many of the nation's leaders can remember well what has happened in the last forty-four years and can thus bring that experience to bear in looking ahead that far. Short though the span of that backward look may be, there is something about it that is terribly important in relation to our look ahead—in those four decades the world mined more of its resources, and used them up, than in all its previous history.

A key man in recreation planning asks, "How can you tell what anybody's going to be doing fifty years from now?" He has a point. A point, but not an answer. Conservationists must do their best at estimating future needs simply because all the resource managers—the commodity producers—are doing *their* best. We don't have to wait on our own research to find out about 2,000. The resource managers have estimates of what the population will be, assuming that it will continue its amoeba-like doubling. They have estimates of how much more leisure time we shall be likely to have, and how much faster we shall be traveling to what more distant destinations.

So take their figures, and apply them to Yosemite, for example. It's overcrowded now. If the population is going to be twice as great and the trend shows that each person is likely to spend twice as much peak-season time in national parks by the year 2,000, and if we further assume that Yosemite should stand no greater-peak-season overload than it already gets, then we had better look around for scenic space for the 3,000,000 people who won't squeeze into Yosemite in the year that Johnny takes his youngest out to introduce him to the mountains.

3. WHO ELSE NEEDS SPACE?

Growth brings many problems; competition for space is one of them. An adolescent admires growth; a mature person is more likely to deplore it, for it doesn't seem to happen in the right places any more. In the adolescent, the thymus turns growth off as soon as the contour is right. The

mature person has no such automatic phenomenon to turn to; only judgment and/or conscience will save him.

Our civilization has yet to show much evidence of a built-in thymus for its adolescence, and we can only hope that judgment and conscience will succor its maturity. There is not yet much embarrassment about the daily homage to the great god Growth, so secure in his chrome-plated niche. This very statement, if it were to be widely read, would probably cause widespread resentment. But does it really miss the truth?

In our commercial world have we yet seriously questioned the difference between the bigger and the better? Can you find any remorse, on the financial page, in the report that this year's volume was greater than last year's? Is the increase ever expressed in terms of the resources spent from the earth's savings? In terms of a new empty space against the sky that another tree will not fill so well for five hundred years? In terms of thousands of tons of iron ore, never to be renewed, now processed and scattered beyond recovery? Or of millions of barrels of oil, an energy reservoir aeons in the making, exhausted into the atmosphere? Or of fertile lands lost under today's new tract or tomorrow's new freeway while the hearts of cities develop an ominous murmur?

No, there are no questions. This is called progress, and of course these things happen. Perhaps it's better not to think too much about how progress is depriving Johnny's youngest of the best of the world we know.

But we can't dismiss him. Assuming that we will be some years in devising a new model of progress—one that won't move us ahead so fast, but will carry more people longer—we can without much trouble make projections of the future's need for resources, and we can then color in, on our master map, the space which we think should be managed primarily for those resources. This four hundred million acres must grow food; that hundred million should bear a tree crop; these ten thousand miles of streams must be inundated by reservoirs or diverted through penstocks; those mountains must be processed for their ore; these plains paved for industry; those hills recontoured for tracts of houses.

4. WHERE ARE THE CONFLICTS FOR SPACE?

Whatever else may grow, and whether the growth is admired or deplored, there is still only one world to count upon and our part of it has firm boundaries. Wherever we might go to look for more space, we could fully expect to bump into someone coming this way on the same quest.

Within our borders there are difficult conflicts already. Final touches are being put on the master plan for controlling the Columbia. There is

conflict over the same space by those who are concerned on the one hand with flood control, hydroelectric development, and river navigation and those who, on the other hand, would retain anadromous fish runs, trout streams, wildlife range, national parks, wilderness, and forest recreation. The preliminary plan is well under way for developing California's water. The combatants are essentially the same. A vast sum is being released for highway development—enough to decimate our scenic resources if it is not spent carefully, producing a final product of finer and faster highways to poorer and sadder places, and affording a chance to hurry through what could have been beautiful in order to arrive at a carbon copy of what you started from.

In the forests the conflicts are already legion. The forester's theme, more and more, is "Nature never does anything right," a theme rejected by all who have contemplated the works of two of the greatest foresters, Aldo Leopold and Robert Marshall, who so skillfully showed why man needs large preserves to which he can turn from time to time to see if nature was not right after all. The exploitation for minerals still goes on, by and large, subject to one test: Is there mineral there? Seldom it is asked, Is there beauty there, and what would a two or three years' gain in minerals cost in terms of two or three generations' loss in beauty? And finally, for the lands not preëempted for farms, cities, reservoirs, power development, forest industries, highways, and mining, there are the signs which say, "Keep Out—Military Reservation."

If these are today's conflicts, what of tomorrow's? As we plot those which exist and those which are likely, we see that the master map looks pretty busy. It will be a perplexing map to consider, but we dare not try to escape that perplexity, not unless we wish to resurrect the rejected philosophy of *après moi le déluge*. The important thing is to project all future needs on the same screen with the same projection distance and same focal length of lens for each scene, and also, to the best of our ability, with the same illumination. Let the light be a cool one.

5. WHO NEEDS THE SPACE MOST?

It would be helpful, in resolving the conflicts for space which we see taking form, to have on hand a battalion of men with the wisdom of Solomon. They should also be handy at putting bells on cats. It is easier to suggest criteria for the men on the court than to propose guidelines for decision, but we're in this too far to back out now. So let us ask: For which of the conflicting demands are we most likely to find substitutes?

For example, consider the Northern Cascades of Washington, near

Glacier Peak. Here there is a low-grade copper deposit, development of which would bisect one of the primary scenic areas of the entire country, an area equal in caliber to our most magnificent national parks. We are going to run out of inexpensive copper one day and will have to get by with substitutes. We had a taste of what this will mean in the course of World War II, when we were confused a little, but not hurt, by having to use substitutes for copper pennies. Mr. Lincoln lent the same dignity to both, and neither bought more than the other. Our economy went on. Glacier Peak copper can delay our dependence upon ersatz copper but a few years. We shall have to find a substitute eventually for gross uses of copper, and our scientists will. But man will never be able to reconstitute the primeval in Glacier Peak once he has breached its superlative redoubt, which he has the tools to do. These are the years of decision—the decision of men to stay the flood of man. We shall have to decide whether to hand the future two voids or one—a world without copper and the primeval, or just without copper.

A Congressman wrote me that he thought this fifth question, who needs the space most, was a loaded one, designed to get someone else to look for substitutes. He is right. Further, the question should remain a loaded one. The decision needs to reserve the possibility for reversal by a higher court, the next generation, which ought to have a few choices left to make. A copper substitute or a wilderness? Fewer pages in a newspaper, or a virgin forest? Another button for starting a new kind of appliance, or a jubilant stretch of white water? Faster transportation to more distant housing, or a greenbelt for a city? If we make all these choices, if we use up all this freedom, what is there left for a more crowded world?

We can't be Solomon, but we can remember his most famous decision, and who was awarded the child. Let those who want the wilderness to remain whole phrase the question as they will. A decision adverse to that whole can never be reversed.

Finally, having decided in favor of the future, we need to make sure that the decision sticks; wilderness protection is paper thin, and the paper should be the best we can get—that upon which Congress prints its acts.

WHO SHOULD CONDUCT THE REVIEW?

There is ample room for difference of opinion about how the Scenic Resources Review should argue its questions, but there seems to be a consensus that the questions need to be asked soon, very soon, and that irreversible decisions relating to natural-resource uses should await the answers.

Various ways of undertaking the SRR are being discussed. What should be the roles of private agencies, of local and state government, of the national executive branch and of the Congress? An attempt to answer this question with a concrete proposal runs into the difficulties confronting any attempt at positive action—difficulties which should never be underestimated. Nevertheless, a *modus operandi* for the SRR needs to be outlined, and we'll try it, then step aside for constructive suggestions.

Should the review be conducted by private agencies, financed by foundations? Probably not. This is too much the responsibility of all the people. Foundations, with their limited resources, might however assist with pilot projects or conduct some spot checks. This is a job for the people by the people's agency, government.

Local and state government only? Much responsibility lies here, but a state isn't equipped to act for the nation; the nearer the government, the more accessible it is to advocates of the short-term interest. The review needs the best perspective we can get. And appreciation of a scenic resource often languishes in the minds of those who see it every day. We need a national view of our scene to guide the best efforts of local government.

Then where in the national government should the review head up?

The National Park Service has some limited authority under existing law to assist in coordinating national recreation planning, and it is staffed with some of the nation's top people in landscape architecture and recreation planning. But it would probably be a mistake to try to use the Park Service for more than the spark plug; a higher echelon is needed at the wheel. Consider the many agencies concerned: in addition to the Department of the Interior and its lands function, we must take into account the Departments of Agriculture (farms and forests), Defense (military land withdrawals), Labor (leisure for working people), Commerce (travel), Education, Health, and Welfare (sociological values), and such other agencies as the Federal Power Commission and the Bureau of the Budget.

This all seems to point directly to a presidential committee or commission, set up under authority of Congress in order to establish a continuity of policy, program, and people to carry on a continuing review. Such an organization is a large order, but are there many who doubt that its creation would receive wide support as soon as the public learns of the need?

WHILE WE WAIT—A CRASH PROGRAM

We need an interim, stop-gap step, a *modus vivendi*, while we wait for the public to become informed and for necessary data to be gathered. The

premature quality of any crash-program decisions will do no permanent harm if they set aside too much scenery for the time being, whereas the premature exploitation of resources in the absence of the broad considerations proposed in the review could be irreversibly damaging. So many major decisions are imminent that there is certainly not time to precede them with complete programs of research to produce the data we shall eventually need.

Right now, today, however, we have in our bureau chiefs a group of very capable men who can give horseback estimates of the answers to the five questions. In the beginning we can tolerate quite a wide margin of error and make adjustments as the data come in. These men can sketch in the inventory of scenic resources; in time the boundaries can be made more precise. Good sets of figures already exist for estimating the rising demand. We already know quite well what space is wanted for commodity production. That, in a way, is the trouble; that is why scenic-need estimates must be sketched in quickly. Once we have the resulting clear view of the major conflicts for space, we have the National Research Council for counsel on the likelihood of substitutes and their imminence.

There is still no short cut for resolving the big conflicts. We know that the democratic process can carry on from here. We can rest easy about what will happen so long as we insist that all the cards are on the table before we decide who is high man, and so long as we act in the context of a Golden Rule extended to Johnny's contemporaries:

For them, a world as beautiful as ours.

Note: See pages 73-84 for testimony given on behalf of the Sierra Club relating several current resource-conservation problems to the need for the Scenic Resources Review.

Covered Wagon Journal

*Extracts from a Summer Journal of Travels Through
the Western National Parks and Monuments*

By PHILIP HYDE

IN JUNE, 1955, my wife and I set out in our newly acquired camping pickup to find out how a summer of being on the move would help us to accomplish our prime purpose of studying and interpreting photographically the western natural scene. Our plans were flexibly hitched to a series of Sierra Club outings. What follows is a collection of extracts from our trip journals of some of the high points of our summer.

June 7. From our sandy bedsite by the Colorado at Hite, Utah, we are recalling the activities of the past two days. Yesterday morning we got aboard a school bus at Marble Canyon Lodge, Arizona, for the climb over the edge of the Kaibab Plateau, and north, to Richfield, Utah, where we turned off the highway into some of the most colorful scenery of the Southwest. Last night we watched the moon flood its rising light over the great white and red cliffs of Capitol Reef National Monument. This morning, after a brief sampling of the Monument, we got back on the bus to rattle on through the heart of the uranium country. In every direction the landscape is punctuated by claim-marking cairns. Will any stones be left unturned before the tide of the uranium madness recedes in this once remote and austere beautiful desert wilderness?

June 13. We started our walk up Aztec Canyon to Rainbow Bridge under heavy overcast. There is a wonderful passage where Bridge Canyon cuts through the walls of Aztec Canyon. One of the choicest bits of canyon we have seen, this proves to be the precise spot where the Bureau of Reclamation proposes to build a cut-off dam to protect Rainbow Bridge from the waters that will be impounded by Glen Canyon Dam. Entering Bridge Canyon we walked on to the grand climax of the Glen Canyon trip. Rainbow Bridge's mighty, free-standing arch was as impressive in the overcast lighting as it might have been in sunlight.

June 14. We were thoroughly awakened at 4:30 a.m. by a crescendo in the chorus of rain that had been constant for most of the night. A short time after it began, it was coming into the tent in wholesale quantities. A large rock falling off the ledge above us tore a huge gap in the tent, and we were forced to leave. Fortunately, it hit to one side, missing us. As we ran toward shelter under some large boulders, we heard an omi-

nous roaring, and looked up to see a full-blown waterfall cascading down into what had been the camp kitchen. But for the quick thinking of some of those who had been sleeping close to the kitchen, much of our equipment and supplies might have been carried into the Colorado. What a demonstration of the power of a flash flood! When the excitement subsided, we looked around in the sunrise light to see the canyon walls draped with hundreds of waterfalls coming down off the rims.

June 19. A little while ago we emerged onto the crowded South Rim of the Grand Canyon, after two days in the lower regions. The first half of the climb was easy, in the cool pre-dawn hours. Once past the half-way point at Indian Springs and the last water, the trail climbs as steeply as a jet plane. And by this time the sun was up, ready to greet us on the shadeless upper bench. With considerable effort, we managed to push ourselves up the trail to the rim, and paused to rest. Then we turned and looked back.

The sheer height of El Capitan, or the great depth of Yosemite never quite make a full impression until one has climbed to Glacier Point, or to the top of Yosemite Falls. So it is with the Grand Canyon—the vast abyss seemed grown a hundredfold.

June 24. We have spent the day and much of the night looking at the exhibits of the Museum of Southern Utah, in Kanab, and talking to the Johnstons, who operate it. The museum's collection of ancient and recent Indian artifacts is exceptionally interesting. Yesterday, we spent part of the day in a canyon in the Arizona Strip to the south, looking at ancient Indian paintings. We were also directed to a "dig" which the museum's archeologist is developing across Kanab Creek. A burial which he excavated is now on display in the museum.

June 30. We are now on the fabled Yampa River. Our boatman, Dave Rasmussen, turns over his oars to another member of the crew, and picks up his guitar for an hour or more of wonderful music that floats out over the lazily moving river and echoes softly from the yellow sandstone walls, sheer cliffs, and rounded domes. We slip around the great curving river bends with no sound but the melody of guitar and the soft singing.

July 1. We have seen three golden eagles soaring high over us as we threaded through the climax of Yampa scenery—the run through the magnificently formed series of bends in the river that begins just below Castle Park. The walls have heightened, and grown more nearly perpendicular, and, at intervals, the river straightens out long enough to provide a vista down the canyon, sweeping from a foreground of river and concentrically curved sandbars, to a prominent feature carved out

of the rim, standing at the far turn of the wall. There are so many of these impressive views on the Yampa, that one loses himself trying to recall the exact location of each. We can only hope, after the recent difficult struggle to preserve this unique canyon in its natural integrity, that it will stay this way, so that we can return, and so that future generations can come and be thrilled and inspired as we have been. This day of days is capped with the rising of the near-full moon, flooding its light over the great cliffs that surround us here in our Box Elder camp.

July 14. The bus brought us to the Gates of Lodore, in Brown's Park, on the northern boundary of Dinosaur National Monument, where a short afternoon run has brought us just a few miles inside the Gates. I wonder if Powell and the other early river travelers who came to this place received any premonitions of disaster when they looked upon this impressive mountain gate. Here the Green River meanders for some miles through the tranquil bottomlands of Brown's Park, resting from its exertion in Flaming Gorge upstream. Then, for no apparent reason, it turns abruptly and plunges into this high plateau's escarpment. The introduction to Lodore is sudden. Once within the Gates, you are committed, and you know this is a formidable canyon. Even the rapids are anxious to start; there are several short but vigorous ones just a short distance inside the Gates. And the canyon quickly reaches its full height, the brick-colored walls rising in coves and steps whose treads are often carpeted with tall evergreens.

July 16. At Hell's Half Mile the water is so low that the beginning of the rapid is a waterfall of about six feet. Our party is scattered on the stream-side rocks to watch what proved to be the first successful folbot run of Hell's Half Mile. The victors, Ray Simpson and Dave Allen, were properly feted when we reached camp, and each was presented a special medal of tin-can top with bread-wrapper laurel wreaths.

July 23. We have headed east into the Rockies from Dinosaur and are based for a few days at Georgetown, Colorado. Today, we have been up into the alpine country above Georgetown, winding through the Engelmann spruce forest on a dirt road that emerges above timberline onto a meadow whose upper limits are defined by the weathered wood walls of houses and stores. Mixed freely with the fields of blooming wildflowers are the blights of other years: abandoned mine buildings and random-spaced mounds of tawny tailings. Beholding such a scene, I cannot help thinking how much of this I've seen in the Rockies. And, I cannot help but reflect on the good fortune of Sierrans, that an accident of geography kept our high country clean. A benevolent providence placed our gold-

bearing ores on the flanks of the foothills rather than on the crest, so we may enjoy both the color of the old mines and the inspiration of high-country wilderness left intact.

July 25. The air is perfectly still as we watch the sun change the hues of the distant wall of the Wind River Range. Our camp is just north of the celebrated old South Pass by which so many emigrants crossed the Continental Divide in their covered wagons. As we crawl into our bunks in our own rubber-tired covered wagon, we can imagine we see a faint line of dust rising on the horizon.

July 26. Yellowstone-bound, we stop to watch two trumpeter swans with three young in a slough of the marsh in Jackson Hole Wildlife Refuge. Beyond them in the distance, looking at first like sticks, are a pair of sandhill cranes.

July 27. After evading at least a half dozen tourist traps the mother bears have set up along the south-entrance highway, we arrived at Old Faithful, just in time for a playing of the geyser. We had come to Yellowstone almost reluctantly, not expecting to enjoy it much because of the usual summer crowds. But something happened to the mood of the place while we were waiting for Old Faithful to play. It began as we looked around at the eager, expectant faces and built up as we began to hear a naturalist giving his introductory talk: even the public-address system became a benign presence, as we realized that we were hearing the pure gospel of conservation preached to this multitude. By the time the geyser had reached its full height, we were transformed. Even in a crowd, its radiance glowed undimmed, and, through some kind of magic, that experience set the tone for the rest of our stay in Yellowstone.

July 29. At the suggestion of a naturalist at Mammoth, we took the old road part of the way to Tower Junction from Mammoth. Traffic had been heavy when we turned off the highway, but we met no cars during the hour and a half we spent driving leisurely down this dirt-road entrance to the Yellowstone wilderness. Even the six pronghorn antelope we came upon seemed a bit surprised to see us.

Though there are so many complaints of overcrowding in Yellowstone, the wilderness is still just beyond the highway, as few visitors go far from the parking lots. The loop highway has become a slow-motion race track, with many visitors making the 160-mile circuit in one day. Many of them refuse to walk even a few yards from their cars to see a geyser or the Terraces.

July 31. A mile away from the parking lot the Black Dragon's Cauldron bubbles and hisses, and sends its "eruptions" of charcoal-gray mud

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30 to 50 feet into the air. It is the more interesting when you learn that it suddenly appeared in the middle of the forest, in 1948. Since then, it has gradually killed the forest around it, encasing living trees in the dark mud until they are suffocated.

August 6. We have been sitting around a fire, quite comfortable, in a tepee of Teton Indian Village, near Jackson. The rain which beats on the canvas slopes of the tepee forced cancellation of the Indian dance tonight. Mr. and Mrs. Reginald Laubin, well-known interpreters of Indian dance, and long-time students of Indian life and culture, are sitting opposite us, telling us about some of the authentic Indian objects with which the tepee is furnished. They have introduced us to some of their Indian friends who dance with them. Red Robin, a Zuñi artist now living in New York, is seated next to Mr. Old Man, a large man, whose twinkling eyes betray his good nature. Next to him is his wife; then Mr. Good Friday and his wife. The Old Mans and the Good Fridays are Arapaho Indians. There is continuing good-natured banter as we begin to play the old Indian hand game. We are divided into two groups, each group appointing a "guesser" and a "hider." One side takes the ring, and the "hider" will conceal it in one of his hands. The other side's "guesser" will try to determine which hand has the ring, and Mr. Old Man beats accompaniment with a small hand drum. In the lulls after a guess, the Indians tell jokes, always making the white man the butt of them. When we leave, after Mr. Old Man has sung us several songs in Arapaho, we remember that we didn't get to see the dances.

August 7. After dinner and preparations at the roadhead for the High Trip that begins tomorrow we drive back to the Indian village to see the dances we missed last night. In front of us, as we are seated, is the dance platform. Behind the platform is a semi-circle of white tepees. Beyond, in the distance, the peaks of the Tetons stand silhouetted against the twilight sky. Mr. Laubin begins the program, performing symbolic dedication ceremonies as a medicine man, lighting the small campfires around the edges of the platform. During the next hour, we watch a procession of beautifully done dances, ranging from the stately Dance of the Chiefs, to the amusing Prairie Chicken Dance, and the exceptional virtuosity of the Hoop Dance. Some of the dances are solos by Mr. Laubin. Often he is joined by Mrs. Laubin and several of their Indian troupe.

August 8. A 4:30 a.m. rising began this first day of the Teton High Trip. Our walk has taken us through meadows filled with wildflowers and through occasional woods of the bright-barked, shimmering-leaved aspens. Beneath the aspens is an almost continuous sea of blueberry bushes,

whose ripening berries slow us down. Our trail enters Death Canyon and follows the course of a stream, ending in a scramble to a limestone bench that commands a fine view of the Tetons.

August 12. Crossing over the high limestone ridge separating Alaska Basin from upper Cascade Canyon, we gained a spectacular view of the high peaks. The great fault-block form of the central Teton massif is readily distinguished from this vantage point. Descending to our next camp near the head of the canyon, we passed through an amazing variety of rocks, culminating in the vicinity of camp in the gneiss of the central Teton block, fantastically twisted and contorted. In the upper basin, we crossed a definite dividing line between the gray and rust-colored sedimentary and the highly crystalline metamorphic rocks. This was probably the fault line, but is so weathered here it doesn't look like a fault.

August 13. Like a scene taken from *Genesis*, the mist has gone up from the face of the ground this morning, wreathing the Grand Teton in a translucent veil of mystery dispelled and returning in cycles. I am poised on the brink of the high ledge near our camp, recording on film the canyon below, as the mist rises and recedes, like a tide in an arm of the ocean, in ever new phases of undulation. Finally, the warmth of the rising sun dispels the mist and sends me back to camp for breakfast.

August 19. We climbed to the top of Mt. Helen, a slight eminence on the high slate ridge above our camp in Big Horn Basin. If it is an inferior peak, it commands a superior view of this part of Glacier National Park. The horizon, through 360 degrees, is filled with a profusion of peaks, many of them sheltering the frozen white forms of ice for which this park is named. Stepping up on the pile of rocks marking the summit, we surprised three ptarmigans, their white underbodies unmistakable in this typical ptarmigan habitat.

August 20. Climbing to Dawson Pass on our way to our next camp at Pitamakin Lake, the wind was cold and brisk. As we gained the exposed saddle of the pass, it took a maximum effort to stay on our feet. The sky to our west was an angry gray, with the wind tearing away pieces of cloud and hurling them at us. As we advanced around the rocky shoulder of Flinsch Peak, a beacon-like mass of broken, flat-sided pieces of sandstone and shale, the pieces of cloud were getting larger. At one point where the trail turned into a rocky gully, we halted to turn our faces out of the freezing wind and the sharp, wind-driven missiles of hail and sleet. For about 4 miles, the trail, grown faint with disuse, traverses high on the shoulders of Flinsch and Mt. Morgan, offering superb views over a wide expanse of eastern Glacier Park.

August 22. Leaving our last camp at Pitamakin Lake, we coasted down the canyon to its junction with Atlantic Creek Canyon, where we turned up for the ascent to Triple Divide Pass. Shortly after starting up the canyon, we realized we were no longer on a trail, but on a junior grade road. Apparently built by a small tractor, it must have been laid out by an engineer who had never walked on a trail, for it set a constant grade and maintained it for about 3 miles, studiously avoiding watering places. Aside from walking on a paved highway, I can imagine no more monotonous experience. And, as if to further demoralize us, we discovered half way up that there was an alternative, not shown on the map. Looking down from our sun-beaten 4-foot wide swath on the hillside, we discovered that the other trail continued up the floor of the canyon, skirted the edge of a beautiful lake far below us, then made the switchback climb up the head of the canyon to the pass, weaving back and forth across the course of the small stream that cascaded down from the snowfields above the pass. When some of the park officials we met later spoke of a disappointing decrease in trail use in the park, I could not help wondering how much experience on that trail had contributed to the decrease. I couldn't help hoping, too, that the tendency, evidenced in many parks we visited during the summer, to place engineering and administrative efficiency over esthetic appreciation, would somehow be checked.

August 28. The light of the rising sun is just striking the great curve of Citadel Mountain that sweeps up from the shore of St. Mary Lake, as we turn our "covered wagon" westward, for the first time this summer, over Going-to-the-Sun Highway and on to Olympic National Park.

September 7. This is the true rain forest, a cool jungle, covered with a great green canopy that all but excludes the sunlight, causing the forest floor to be bathed in a soft, pervasive green glow. The forest floor is more open than you might expect. Occasionally, there are moderately long vistas down the forest aisles which give you an opportunity to gain a better perspective on the immense size of the mature spruce, hemlock, and Douglas fir trees. At the end of the dirt road that leads east from Highway 101 to the campground on the Hoh River, a short nature trail loops around a choice sample of the forest. At one point the trail enters the Hall of Mosses. Great maples are hung with dense clumps of moss, and long streamers of moss hang down from the vines that are spun from trunk to trunk. Here and there a rotting remnant of a tree appears but dimly, its every form-defining edge softened with a cushion of moss. Often these fallen giants are covered with legions of seedling trees—new forest life, rooted and nurtured in the old.

September 9. We are working south, tracing in reverse the westward course of the rivers fed by the great accumulation of ice and snow on the heights of Olympus. Each of these river valleys is densely forested with the climax type of rain forest that once covered the coastal slopes from Alaska to California, and is today represented in its virgin state almost exclusively in Olympic National Park. Coming up the roads leading into the park from the highway, there is no question when you reach the park boundary. The great green curtain falls at the line, and you pass from a scene that often looks more like a battlefield than a forest, into the peace and serenity of a forest floor unmarked by the often aimless and destructive paths of caterpillar tractors, and unscarred by the wholesale destruction characteristic of logging operations. A picture of that line of demarcation along the western borders of Olympic will always come to me when I hear loggers talk of just wanting to "take out a few of the overripe trees that will die soon anyway," or speak of "sanitation cuts," or "down timber salvage."

September 10. The green cathedral of the rain forest on the East Fork of the Quinault bestows a kind of benediction on our summer's travels. We have walked down the trail in silence, knowing that our summer wanderings are drawing to a close. But our silence is one of gratitude. After a summer in the parks, we are more aware of our great riches. The remembered beauties of those places of wonder flood over us, as our imagination takes us back to a scene described in the museum in Yellowstone. The time is 1860. A group of men are camped in the meadows by the junction of the Gibbon and Firehole rivers, sitting around one of their last campfires, discussing the future of this area so full of natural wonders that they have been exploring. They have decided, at length, that it should become a preserve, set aside for the people. This was the beginning of the movement that culminated in the establishment of Yellowstone as our first national park.

Traveling through our western landscape, while being grateful for our parks and preserves, we cannot help noticing the contrast between them and the lands in between, which, increasingly, become the battlegrounds of "progress." How fortunate we are that for all those who came to dig, chop, plow, and burn, some came who saw, and valued, and then worked to preserve. May there be enough of these, in *this* generation, to enable us to pass on this priceless heritage to those after us.

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A New Route on Mount Robson

By MICHAEL SHERRICK

ARE YOU SURE you have a good belay?" shouted Don through the wind and mist, just a hundred feet or so from the highest summit in the Canadian Rockies. I said I had and Don inched his way up toward a nearly vertical ice chimney covered with frost feathers. Every few feet he tested the hard snow for some ice in which to put a piton. Since he could not find any, he cut deep steps into the hard snow and ice feathers and positioned himself with his back against one wall and his feet on the other. Again he asked about the belay, for he was now 40-50 feet above me and in a very insecure position. Every once in a while there was a break in the clouds, permitting us to see the small, blue dot of Kinney Lake, more than 9,000 feet below us. Don worked his way up higher. Every crystal of ice or flake of snow that he dislodged with his feet blew upward into his face. Now he stopped to try to regain his strength, taken away by the arduous labor and piercing wind. An eternity later he reached the top of the chimney where there was a hard patch of snow and a more gentle slope that led at an ever-decreasing angle toward the summit.

It had been just a few days before that our party of six arrived at the 1955 Canadian Alpine Club camp at Berg Lake. There we had met Don Claunch of the Seattle Mountaineers, and after much discussion and many warnings, Harvey Firestone and I had decided to join him in an attempt to climb the Schaufelberger Ridge of Mount Robson while the rest of our party tried the east-face route.

To climb the south-southwest ridge of Mount Robson (12,972) was an early ambition of the Swiss guide W. Schaufelberger, who led four attempts on it between 1913 and 1920. At one time he was within a few hundred feet of the summit, but weather and snow conditions turned back his party. Since that time more than thirty attempts had been made, and one man had lost his life while climbing alone on this route. Most failures were due to the mountain's notoriously bad weather. The Canadian Alpine Club had placed its 1955 summer camp at Berg Lake and hoped to send several climbing parties up the mountain. The weather had intervened, however, with almost two weeks of rain. We hoped that our arrival might be the time for some good weather.

On August 7 we shouldered our packs and set off to make high camp. We had already come halfway around the base of the mountain, and now we were to encircle it partly, in an entirely different manner. After wading

a number of stream channels we ascended to a broad ledge of talus just below the "yellow band" of rocks at about 8,000 feet. This ledge runs almost halfway around the mountain; so we used it to gain the base of our objective by walking around to the southwest face. As we came around the southwest corner the top of the mountain was in a cloud, but we could see the long, broken series of gendarmes that lay along the ridge. We stopped and carefully inspected the jagged route to the point where it disappeared into the clouds. It would be a long, hard climb. We made high camp on the left moraine of the Fan Glacier. The weather did not look promising, but we were prepared to stay several days.

We awoke the next morning to the spattering noise of occasional raindrops and the harsher sound of falling hail. In order to fill in the time, we spent the day organizing our climbing gear and preparing a bag of dried fruit, nuts, and dates for our attempt. We decided that in order to have the best chance we would have to go as light as possible. We would not take sleeping bags, but we would take a tent and a light poncho for our bivouac. Extra sweaters and socks, plus a few candles, would supplement the climbing pack. All day the question which lay foremost in our minds was, "How long will this storm last?"

On the morning of August 9 the upper reaches of the peak were hidden in a cloud. Outside the tent it was misty. While still in our sleeping bags we deliberated starting the climb, or at least making a reconnaissance, but the warmth and comfort of a good sleeping bag do not inspire action. Soon it seemed that there was more light coming through the walls of the tent. We looked outside and saw that the weather had cleared. Shining down on us was the gleaming row of ice teeth that forms the upper portion of the Emperor Ridge where it leads toward the summit. Within an hour we had eaten a hasty breakfast and were setting out on what was to be the greatest adventure, and the longest ordeal, of our lives.

At first the ridge was wide and we had our choice of climbing in gullies or on rock ribs. After several hours, however, the ridge became narrow and we were forced to attack each gendarme directly, for the sides of the ridge dropped away at a very steep angle. The noon sun was melting the remnants of yesterday's storm, and water seeping down the walls and faces made the climbing over loose rock more treacherous. Every once in a while a particularly smooth or loose spot or a small overhang would increase the difficulty of the climb to medium fifth class. We used a dozen pitons for protection where the difficulty warranted. As we climbed higher on the ridge we began to pass occasional patches of snow. When late afternoon approached, some of the rocks became icy. We could see that

we were nearing the upper part of the ridge, which was covered with ice and snow. We began to look for a place to bivouac and found a small patch of snow on top of a gendarme just below the junction of the ridge that comes from the southwest. This southwest ridge and the one that we were on form the "wishbone," which is a prominent feature of the mountain. The snow patch was just large enough to accommodate our tent. As darkness approached we erected the tent and climbed in to spend the long night.

We coiled the rope on the floor of the tent and covered it with the poncho to help insulate us from the cold snow underneath. We lit a candle and began to munch some dried fruit. After some time it became evident that the candle would be necessary to keep off the encroaching cold of the night; it is surprising how much heat a candle can produce. At last we leaned back and began the long wait for sleep which did not come. Toward morning when the night was coldest and the hours were longest, we would doze for a few minutes, but the cold would soon bring us back to our senses. There was a constant struggle to keep our feet near the candle and a longing for the coveted middle spot. Occasionally we ate a few bites of dried fruit. Eating helps to pass away the time, and it keeps one occupied. When the first light of dawn appeared we lit all the candle stubs and warmed our feet and hands as best we could. Then we put on our frozen boots, packed our gear, and climbed out into the cold.

Up above us rose the gleaming row of ice teeth which we would reach in a couple of hours. We strapped on our crampons, for the snow was hard and we did not want to cut steps. Soon we had passed the last few rock pitches — climbing rocks in crampons was no fun, but crampons made the snow climbing between the rocks much less difficult. As we started up the first large gargoyle the ice and snow climbing began in earnest. Don, with his ice and snow experience, did most of the leading.

I now had time to look around and appreciate our position. The weather had been perfect for the past twenty-four hours and there was nothing in sight that indicated a change. Far below us, in the blue depths, lay Kinney Lake, and the dark green Fraser Valley stretched for miles into the distance. To the southeast were the tall, leaning pinnacles of the Ramparts, and to the southwest were the high peaks of the Caribou Range. Along the horizon, as far as the eye could see, lay row upon row of peaks, all clad in snow. No wonder Conrad Kain said, when reaching the summit of Robson, "I see more glaciers than there exist in all of Switzerland." To the west, and now below us, was the massive peak of Mt. Whitehorn. On the shoulder of Mt. Robson we could see the upper reaches of the

Emperor Ridge with its long row of pinnacles clad in ice and snow and gleaming in the sunlight. Far below us on the south-face route a climber appeared and was joined by two others. We caught their attention but could not communicate with them. Along the eastern summit ridge we could see the tracks of the rest of our party, who had reached the summit the day before by the east-face route. We hoped that we would also be successful.

In the afternoon the sun started to melt the upper layers of the snow and ice feathers and our footing became insecure. Sometimes the surface gave way and left us hanging by our ice axes or occasionally by the rope. When Don encountered a pitch that was nearly vertical he called for an extra ice ax, jammed it into the rime, and put the rope around it. Then he used the other ax to pull himself upward and to support himself while he placed the first ax higher. This strenuous method helped us pass the most difficult gargoyles. Sometimes we could dig deep into the ice feathers and find rock in which to put a protective piton, but this was not often—most of the time extreme caution was our only safeguard.

No one can remember just how many gargoyles stood on the ridge. Each gargoyle presented its own special problem, and we usually climbed directly over it because the sides of the ridge dropped away so steeply that we traversed only as a last resort. When about an hour of daylight remained we had one more gargoyle to climb; only 150 feet remained between us and the summit. Thus far along the ridge we had been able to view our objective and had chosen the line of least resistance, but this gargoyle seemed to show no weakness. Don wanted to make a traverse over some vertical, icy rocks and gain a steep snow ridge that led to the top of the gargoyle. It soon became apparent that we could not get across the rocks by fifth-class means, and we did not have enough pitons to make the lead sixth class. We decided to make a traverse into a steep snow couloir which might lead to the summit, but we would have to wait for morning and better snow conditions.

Another night out in the bitter cold, and without candles, was a gloomy prospect, yet in this situation it was unavoidable. Some clouds were gathering on the horizon but we hoped they would not spell bad weather for a day or two. We descended about 50 feet to a snow platform on which we erected our tent. Just before sunset we had everything ready and crawled in for the night. During the night the wind began to shake our tent. In the morning the top of Robson was shrouded in a swirling mist. We pulled on our frozen boots and struggled with frozen crampon straps. Soon we had everything packed and were ready to begin climbing.

Don led down onto a 55 to 60 degree snow-covered ice slope. He started traversing to the center of the couloir, and every 20 feet put in an ice piton. We made sure that there were two pitons in at all times. The route above looked quite forbidding to me, but Don assured us that it could be climbed. Harvey and I took belay and anchor positions on a small, firm ledge of snow while Don began his long, dangerous lead toward the summit. He worked his way up a steep snow slope into a nearly vertical chimney covered with ice feathers. At the top of this chimney, he cut steps up a steep snow slope which led directly to the summit. After the long 200-foot lead, he found a secure belay position and called for Harvey and me to join him. Soon all three of us clasped hands on the summit. But we did not tarry long, for the lack of food and sleep, allied with the cold and wind, had given us good reason to descend to high camp with all possible haste.

The cloud which shrouded the summit gave us no view, but by the time we had descended to the upper glacier we found that we were leaving the clouds above us. We had found the tracks of the party which had reached the summit two days before and followed these tracks down the col. We climbed down the glacier and reached the imposing ice wall. The rappel picket, which had been such a nuisance so far, became worth its weight in gold; we anchored a rope and began the 80-foot rappel to the bottom of the wall. Close by the line of descent was a narrow crevasse which offered an easy way up to any ambitious person who chanced to climb near enough to observe it.

A downward scramble over broken ice blocks and then a steep snow slope brought us to "Little Robson." Descent of the lower glacier then soon brought us to the familiar yellow band of rocks, where we chose a ledge and began our long traverse across the south face toward our high camp. We arrived at camp just as the sun was beginning to set on August 11, feasted, and began a well-earned night of sleep.

The next morning we retraced our steps across the large band of talus and climbed down the intricate couloir system to Berg Lake.

The Cascades Wilderness

By GRANT McCONNELL

HIDDEN behind the lesser ridges of the rocky spine of northern Washington lies the nation's finest alpine area and one of its most untouched primeval regions, the Cascades Wilderness. Here, entwined in the crest of the Cascade Range, is a land of high peaks, deep valleys and rushing water. It is a land of dark forests and shining glaciers, of fierce torrents and placid lakes, of dense almost impenetrable undergrowth and of open flower-strewn meadows, of sunlight and shadow. It is a sanctuary, one of the country's last and perhaps its greatest.

Two names mark the location of this wilderness on the map, Glacier Peak and Lake Chelan. Glacier Peak, the least known of the big Cascade volcanoes, is the dominating sight from any point from which it can be seen. It is the highest mountain between Mount Rainier and Mount Baker and, after Baker, bears the heaviest burden of ice in proportion to its size of any large peak in the United States. Lake Chelan, twisting fjord-like in its 55-mile length, occupies the deepest chasm in the country. The lake level is 1,100 feet; peaks just under 9,000 feet look down upon it. The lake bottom is 1,500 feet beneath the surface.

Yet these facts give little hint of the region's true grandeur. Between Glacier Peak and Lake Chelan and extending north to the Canadian boundary are many mountains. They are peaks with sharp outlines, glacier-hung, and abruptly uplifted from the valleys below. In cirques beneath the crags there are often lakes of surprising size, and waterfalls from the upper glaciers sometimes drain uninterruptedly into their surfaces. The valley floors are low, often less than 2,000 feet above sea level, while the summits above frequently touch 8,000 in a horizontal distance of less than a half mile. Astride the crests between the peaks there is an extensive zone of park lands—meadows dotted with pools and clumps of alpine fir and hemlock, lined with small streams, and covered during the closely succeeding seasons first by the glacier lily and later by myriads of other species.

But for most of the year, the snow is deep upon these mountains and meadows. It accumulates in great depth, for the Pacific is not far off and the region of extreme precipitation is just a few miles away. Always, up high, there is snow close by and numerous glaciers, most of them small, but some of large extent. And always, too, the forests are at hand. These are at once the green mountains and the white mountains.

It is curious that this region has been so long passed by. There was a time, it is true, before the automobile had rivaled or supplanted water travel, when many travelers came up Lake Chelan and paused to wonder at the mountains about its head. This was also the time when prospectors in the backwash from the great strikes on the Yukon and elsewhere rushed in to stake new finds. There was ore but the quantity and quality were disappointing. Despite the deliberate burning of whole valleys of timber, the great discovery was not to be made. The proud boast of early days in the century, that here would develop "a second Butte," proved false. Gradually, the country was abandoned and forgotten, even before more than a part had become known.

As automobiles multiplied, roads spread along the lines of little resistance. But engineers found to be true what had been reported in 1882. In that year, Lieutenant Henry H. Pierce had forced his way through the country in search of a military route through the mountains. His experiences were so forbidding that he concluded the route "could in no wise be recommended"—anyhow, "a small force in the Okinakane and Methow valleys would close the trails and effectually separate the Indian tribes." No road was built and the Stevens Pass highway, far to the south, remains the most northerly across the Cascades.

The arduous route of Lieutenant Pierce was an Indian trail, one used perhaps but rarely, for, if the stories handed down are to be believed, this land held a spell for the Indians too, a fearsome one. Yet somehow they dared the mystery and passed through the range, leaving the name—*Stehekin*, *The-Way-Through-The-Mountains*. They also left a record in the form of paintings upon the sheer granite walls of Lake Chelan, unfortunately targets for the rifles of modern vandals.

Who else was there in the region? There is the tantalizing evidence of a few beaver traps, the remains of a cabin through which large trees have grown. Were the men of the Hudson's Bay Company here? This is unknown, but the start of remembered history is the traverse of Lieutenant Pierce and the visits of the miners who came afterward. The miners—prospectors rather—wildest of romantics, came in a trickle and then in a midwinter rush to be on the scene at the beginning. It was a beginning of almost nothing, despite the hardships that were endured. A hundred men wintered in the heart of the range in 1911; twenty Russians, the story goes, worked in tunnels at 5,000 feet in Horseshoe Basin, while avalanches passed over their deep-buried camp. Twenty connected lengths of stovepipe were needed to reach the surface of the snow. Yet the claims yielded nothing.

The prospecting dream would not die. The story of a lost mine, a classic of every area where ore has been found, still lives. An old Indian (a chief, no less) came into the country formerly at yearly intervals. He came out, it was said, with gold, despite the geologists' agreement that the land is too young for free gold to be found. But there were silver and copper and lead in the small stringers which had been located. Companies were formed, one controlled by a group of Englishmen. For a while, the Englishmen's mine was visited by their officers every few years. By horse and afoot they climbed over the range by the perpetually snow-filled Park Creek Pass. On the last trip out, a storm of early fall struck while the party was on the pass. Seventeen horses were lost and the rest of the party barely escaped. The company's equipment still lies rusted and unused.

So it has gone. The dream of discovery and the chimera of quick wealth have both been false. With only a couple of exceptions, the "mines" have been illusions. The miners have been defeated by the country, but on the other hand they have left scars as the mark of their passage in the few parts which they attempted to occupy.

For the rest there are the few individualists who have chosen to live in the heart of wilderness. There are several homesteads yet and it is just possible to reconstruct the record of the region's permanent inhabitants. They have used the country but their marks are few, for their numbers have been small. The tourists have come, but they have not yet crossed the threshold of the true wilderness. The roads lie beyond the foothills, and the foothills hide the alpine region. Even Glacier Peak itself is invisible from any major highway. The inner world of mountains has remained almost unknown and unspoiled. Its sounds remain solely those of wind and moving water. The fact is the product of accident, no credit being owed to the policy of men, but the chance is good fortune, for the region is among the superlative areas of the continent.

The Cascade Range, of which this region is the true climax, has been termed one of the most dramatic boundaries between climates to be found in the world. Precipitation on the west of its barrier often exceeds one hundred inches; that on the east is frequently less than eight inches. The life of the regions it separates is as strikingly different as the figures of precipitation. The difference is one of vegetation, of animal life, of human enterprise, even of social outlook.

Within the range itself, here at its greatest breadth, however, there is great diversity. There are dark V-shaped valleys filled with dense, moss-hung firs and hemlocks; there are deep U-shaped valleys, some filled with

an interlaced growth of alder, others that are carpeted from side to side with grass. On some ridges the timberline is at 5,000 feet; on others it is above 7,000. On some peaks glaciers descend to 5,000 feet, on others the level is higher.

The glaciers are varied. The largest cluster is that of Glacier Peak, but there are several other large systems. The group on the Agnes peaks, above the West Fork of the Agnes, includes the Chickamin, one of the largest. Between Boston and El Dorado peaks there are numerous glaciers, including the Boston and Inspiration glaciers, both large. The most interesting group is that spreading out from an unnamed dome-shaped mountain south of Glacier Peak. This is perhaps the nation's best living example of the icefields with radial glacier systems which characterized the great ice ages. The Honeycomb Glacier, which descends nearby, is more than 3 miles long.

Most of the other glaciers are small. They lie on all but a handful of the many peaks touching 8,000 feet or more. Numerous lesser peaks also have glacial remnants on their east and north faces. Some of these hanging remnants are among the most spectacular, for they are often deeply split and on warm days send tons of debris thundering into the canyons. A number of the glaciers have receded so far, in the last few decades, that their status as living bodies is in doubt. The Lyman Glacier has lost approximately a mile of its length during the short period it has been studied and the Fremont Glacier is now hardly more than a smooth névé-covered plateau. Just on the opposite side of Mount Logan, however, the rarely-seen Douglas Glacier remains a great tumble of séracs and crevasses.

There are few places where the influences of glaciation, past and present, are so apparent. Thus, the record of the prehistoric 75-mile-long Stehekin Glacier, which carved out the great canyon of Lake Chelan, is almost obvious when one visits the head of the Stehekin Valley and looks up at the half dozen glaciers still remaining as the fragments of that once mighty stream.

The diversity among the glaciers is matched by the character of the mountains themselves. Although the Cascade Range is relatively homogeneous, it consists of two seemingly distinct systems. The one is the long series of low ridges surmounted at irregular intervals by the famous volcanoes. This is the system with which travelers and the natives of the Pacific Northwest are familiar. It extends from just north of the Canadian boundary to Lassen Peak in California, the length of the entire range. The other system is a maze of sharp rocky peaks and ridges formed by the folding and buckling of the earth's surface. It extends from southern Brit-

ish Columbia nearly to Rainier. It is reminiscent in some respects of the Sierra, except that the peaks of this Cascade system are usually higher above their adjacent valleys and their massifs are more sharply set apart on all sides.

In the region of the Cascades Wilderness these two systems mingle. Glacier Peak is distinguishable at a glance as a volcano. Its form is nearly classic, since it, like Baker and St. Helens, is among the youngest of the Northwest fire peaks. There are several lesser volcanic cones which have been discovered south of Glacier Peak. The rocks of this system are the usual friable volcanic materials—lavas, pumice, and andesite.

The rocks of the other system are mainly granitic. Recurrently, while traveling through the region, one encounters clean walls of gray granite that seem transposed from Yosemite. Yet, here too, there is much variety. The gray shades imperceptibly into pinks and reds, and the granite merges with metamorphic types. At some places in the region, too, there are other kinds—limestones, shales, and fossil-bearing sandstones.

The mountains built of the predominating granites and schists are bold in outline. They have sharp summits, and the ridges which connect them are frequently serrated in a multitude of fantastic spires. Even on their lower slopes there are many cliffs and deep-cleft canyons. An unwary explorer can easily get into trouble in these mountains.

The pattern of life within the region is complex. One moves, from west to east, through the dark skyless forests of great Douglas fir into the sunny, open forests of ponderosa pine. As one climbs from the valley floors toward the snow-covered rocks, groves of lodgepole pine give way to towering stands of Engelmann spruce and western hemlock, then to the clusters of alpine fir and alpine hemlock, then to the ridge-lines of mountain larch and lonely white-bark pines. There are changes of topography and soils, too. In some valleys, where fire and the austerities of weather have dominated, there is brush, tag alder, and vine maple. In such valleys, the largest trees are frequently cottonwoods, although here and there are thin lines of alpine fir.

It is impossible with these variables to distinguish between the lines of the east and the west or among those of the various life zones. Douglas fir mingles with ponderosa pine in many valleys; Engelmann spruce appears occasionally side by side with both. Some alpine fir is to be found at 2,000 feet, although its proper terrain is at 5,000 feet and above.

On the western side there are splendid stands of timber of commercial value. Here are Douglas firs towering 250 feet. Elsewhere, however, the timber often has but limited value for lumber. Much of the timber is rela-

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ALONG THE SAUK RIVER APPROACH—ALMOST A RAIN FOREST

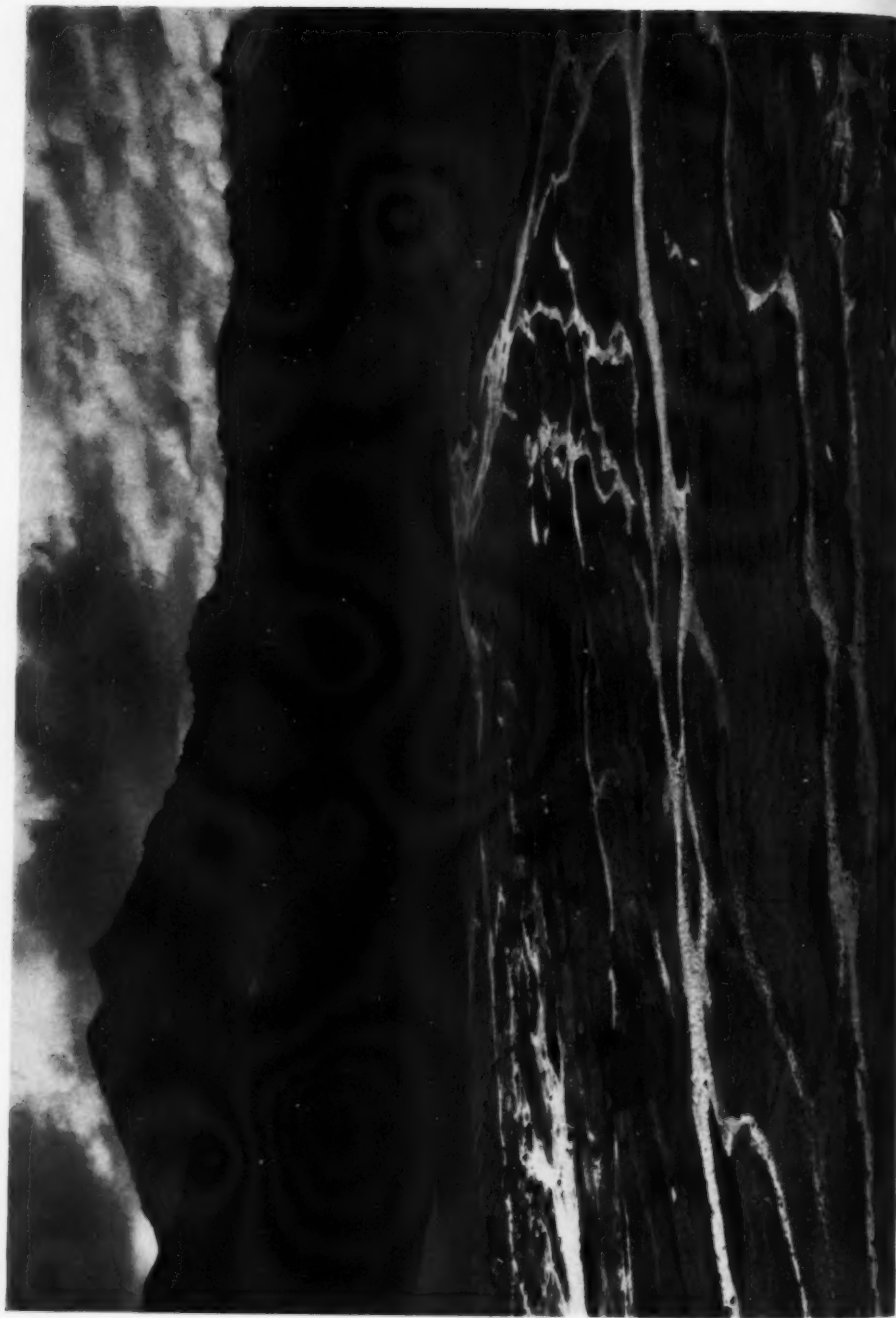
Glacier Peak Wilderness. In the Cascades of northern Washington is the finest unprotected scenic beauty in the United States. It was first considered for national-park status a generation ago. Few have yet learned how exquisite the country is. The photographs are by Philip Hyde.



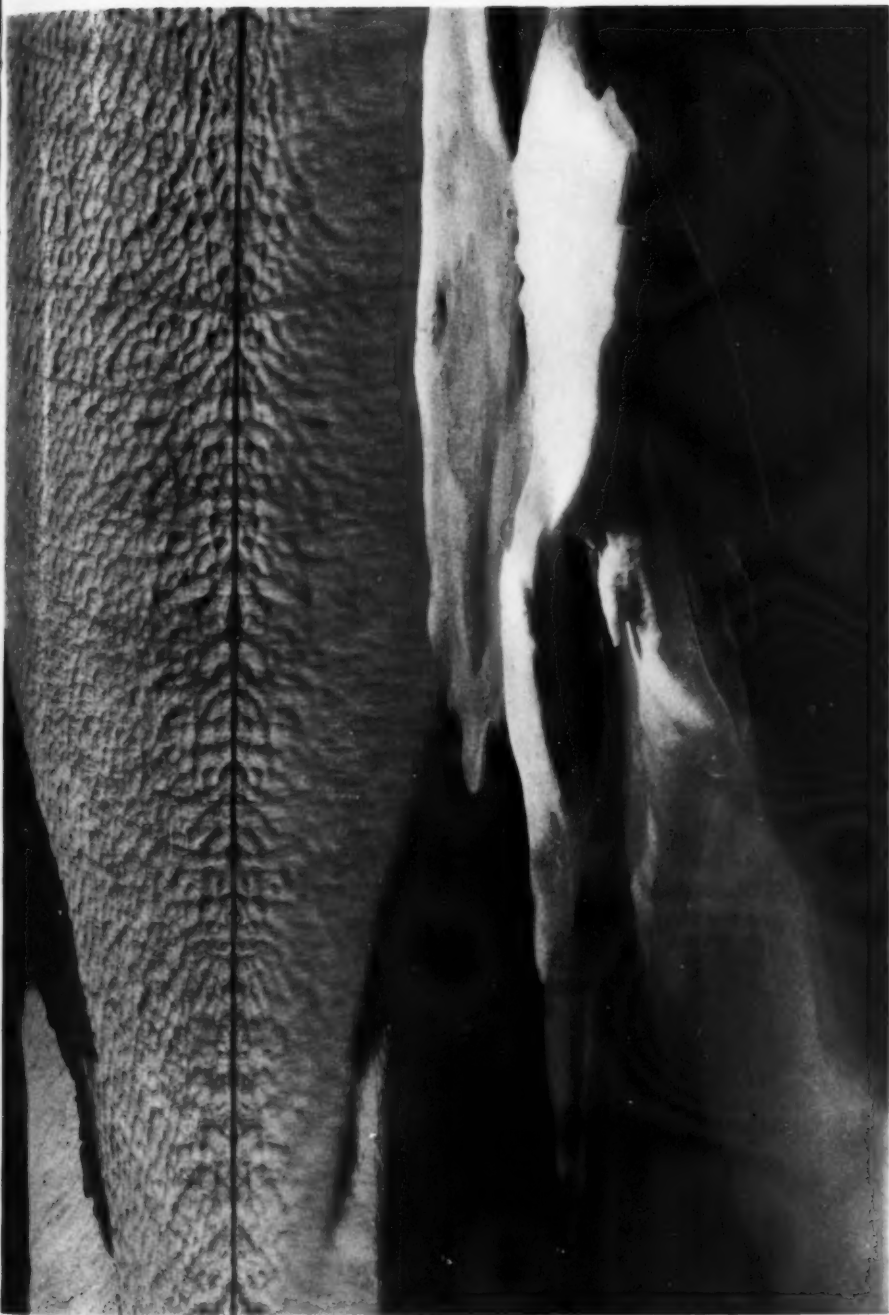
PRIMEVAL STILL
—THE SUITABLE
RIVER
APPROACH



WHERE GLACIERS
LEFT THEM,
HIGH IN THE
WHITECHUCK
BASIN



MEADOWS IN
THE BUILDING—
WHITECHUCK
HEADWATERS



HIGHER STILL IN
THE WHITE.
CHUCK BASIN



ALMOST TOO
PERFECT —
GLACIER PEAK
FROM IMAGE
LAKE



ON THE EAST
SIDE—BONANZA
PEAK FROM
LYMAN LAKE



WHAT A PRIMEVAL FOREST
STANDS UPON,
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TRAIL

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tively small. Its wood is exceedingly hard, strong, difficult to work, and given to serious checking and splitting. Western red cedar, Alaska cedar, western white pine occur in scattered stands, but the Douglas fir is the primary commercial tree. Since the growing cycle is long, any trees that are cut are not soon replaced. Yet there are those who would destroy them for a transitory gain. The value of all of these is as trees and as forest, as integral parts of a magnificent whole.

For all its diversity, the region is a unity. Within it, life mingles its different varieties. At moments, it seems as though here is a bit of the arctic, as when a strange shadow on the snow of early spring reveals a white ptarmigan silently standing. At times the region is reminiscent of the tropics, as when a cougar, truly the mountain lion, is surprised in the forest's dense undergrowth. In early spring, the deer—they are the large mule deer—make their way up from the foothills into the heart of the mountains and, as the snow recedes, climb to the high uplands where they are safe until the storms of fall. The bears—black bears save for an occasional wandering grizzly—emerge before the snow is quite gone and stay out until the mountain ash is in full fruit and then retire for the long winter. Some of the animals are residents of small areas, but for others great tracts of the region are the terrain of long migrations. Some of the migrants are solitary, like the cougar, the wolverine, and the marten. Others travel in herds. Perhaps most fascinating of these are the mountain goats, of which the region has the largest herds in the nation. In summer and fall they are high on the peaks, moving singly or in small groups through the rocks they share only with the marmots and conies. In winter, however, their migration takes them not out of the mountains like most of the deer, but down the slopes, in places to the 1,100-foot level. During February they can be counted by the dozen at the edge of Lake Chelan.

For man, too, the region is properly a unity. It can be exploited, it is true, for the small gains to a few that will come with the logging of its timber, mining the scattered veins of metal, building roads, and establishing resorts. Some attempts along these lines have been made and the pressures for opening the region to this kind of "development" are growing. If the pressures succeed, however, something unique and of great value to the whole nation will be lost forever.

As it now stands, this is a wilderness enclosed within some of the finest mountains of the country. It is yet uncut by roads, almost wholly undisturbed by commercialization. Without doubt the high peaks will some day be known as among the greatest we have, whether there is "develop-

ment" or not. Yet if the "development" comes, the subtle changes of mood which so strike travelers now will vanish. The area is not difficult to visit. Its edges are no more than a hundred miles from large centers of population. It can be entered in complete leisure by the half-day boat trip up Lake Chelan. One of the finest areas, Cascade Pass, is only a mile and a half from the roadhead. Other points, it is true, are accessible only to those willing to take several days and to go by horse or by foot. However, some of the best parts of the region have already been seen by children. It is not necessarily a forbidding country. Some of it, indeed, remains unexplored. It is good that there should be such parts. The region yet offers a fortunate few the experience of being the first to probe into valleys, the first to step upon now unclimbed peaks. However, the experience of exploring wilderness can remain for generations to come in a very real sense if the area is protected. No single visit, no number of visits will drive away the haunting quality of the region, if the visitors approach with the respect which the country deserves. It can remain a land always new and forever to be explored.

At present, much of the region is classified as a Limited Area under Forest Service regulations. At one time the area was proposed as a national park and its superlative caliber was recognized by the Park Service. The proposal died under a variety of pressures and because the area is generally unknown. Later, after a visit by Robert Marshall—the trip on whose return his untimely death occurred—the Forest Service marked out tentative Wilderness Area boundaries that would have enclosed approximately 600,000 acres. These boundaries were not well drawn. They did not follow natural lines of topography and excluded many fine parts of the wilderness. Nevertheless, in later years the proposed boundaries were changed to reduce the protected area by 60 per cent in order to allow for the exploitation of supposedly valuable mineral deposits in the northern parts. The reduced boundaries are now under consideration by the Forest Service as those for a prospective reclassification of part of the region under the U-1 Wilderness Area regulation.

The proposals based on the old boundaries are grossly inadequate. This is evident to those who have seen the most popular areas, Cascade Pass and Lyman Lake; both are excluded. However, there are numerous other points of great scenic value which are also beyond the lines of the proposal. Parts of the area are completely unknown; the whole of it has not been seen in even a cursory fashion by anyone. It is yet impossible, then, to give any really sound delineation of proper boundaries, whether of a national park or of a Forest Service Wilderness Area. The only certainly

sound policy at the present is one of great caution in exposing any part of the region to exploitation.

Unfortunately, the pressures for easy entry and exploitation are rapidly growing. This is in part the result of population growth in the Northwest. However, it is also the result of a quickened sense of easy profits by the few who are without respect for the national heritage. There is a quiet haste to preempt the decision before the nation is aware of what is at stake. There is no question here of the good will of the Forest Service, many of whose officers have been drawn into their profession by a spirit of dedication. However, they are torn by the need for economic development and the demands of politically minded entrepreneurs.

The multiple-use policy is one of the genuine glories in the management of natural resources set forth by any nation. Yet, the time when it was formulated was different from the present. Now, the great expanse of wilderness has receded in most places to nothingness; population is growing at an accelerated rate and the pace of travel is mounting with continually increasing velocity. Each year new multitudes cross and recross the nation on a quest for the vision of undesecrated remnants of our natural scene. Yet, more and more of these travelers find that their pilgrimages are futile.

The multiple-use policy can be made relevant to the needs of today only if it is re-founded on a determination to preserve the values that are essential to a healthy civilization and on a recognition that all values cannot be mixed without the extinction of some by others. Many areas can properly support a mingling of logging, grazing, recreation, and other uses. A few areas, those in which wilderness and scenic grandeur are of a superlative order, must be zoned for their highest purpose and exploitation firmly excluded. These are not the playgrounds of the nation, but rather its sanctuaries.

The issue is nowhere of greater importance than in the Cascades Wilderness. A region as splendid as any in the nation, one unique in alpine character and beauty, has by accident been preserved as real wilderness. It remains to be seen whether the intelligence of man can do as well through policy.

Summer in the Sierra—1919

By LOYE MILLER

TWO OR THREE decades of living in sight of California's mountains had given me little more than a speaking acquaintance with them but none the less it had inspired a great longing to know them more intimately. The boyhood home in Riverside was set down in a beautiful valley walled in almost completely by abrupt mountains. They stood up blue and sharp in the clear air of those days before industry dulled the view with dust and smoke.

We boys knew our friendly neighbors, the mountains, by name—Old Baldy, Cucamonga, San Bernardino, Grayback, San Jacinto, Gavilan, Temescal, Sunset Peak—they almost completed the circuit. We learned to know their relative heights by the snowfall on their summits. We could judge their distance by the degree of blueness that they appeared to hold. We looked up to them across the great open spaces that came right to our very door in those days. I learned to love them and it was a delight to see them there—to feel them cradling my small boy world.

During high-school days I managed to pay short visits to the local mountains by making use of trains to foothill stations and then backpacking in or by buck-board travel over some of the lumber roads. Later on as a young teacher in Los Angeles, I conducted summer schools of biology at public camps in the lower elevations and I took many one-day hiking trips into the Mount Wilson area back of Pasadena. At Christmas time in 1904 I reached the summit of San Antonio Peak (Old Baldy) in this same fashion. Nine years later I observed the sunrise from the top of San Gorgonio (Grayback).

The summer of 1919 brought a change of scene and activity. I decided to spend the summer with my two boys, Alden (13) and Holmes (9), and their mother at Fallen Leaf Lake near Lake Tahoe. It was a momentous decision and bore delightful and profitable fruit.

We left Los Angeles July 3, 1919, in the "Side Winder," our five-year old Model T (perhaps it is sufficiently known that the side winder is the smallest species of rattler and will tackle anything). The Ridge Route to Bakersfield was under construction so we went out through Boquet Canyon to the Antelope Valley country and swung west toward old Fort Tejon, camping the first night in the Joshua Tree Forest between Fairmont and Neenack. The "highway" was just a desert road—dusty and

winding. Worse still, it was being more and more burdened with traffic that wished to avoid the older and more mountainous route by way of Tehachapi and Mojave. Open cars were about the only type yet developed for country use and we met all sorts of vehicles. One particularly comical picture sticks in my memory. As a big open car approached us, I was puzzled to see a linen-dustered and veil-swaddled dowager on the back seat holding some object in her hands and making considerable effort to keep it out over the fender on her side. Only as she came nearly opposite us did we finally make out that she was carrying a glass bowl containing live gold fish.

We stayed a few days at my brother's ranch at Modesto and then entered the mountains by turning to the right up the valley of the American River. We made camp six miles above Placerville, having traveled 135 miles in one day from Modesto (a long day's drive for us in that period). As soon as we got into the foothill country at about 1000 feet elevation we began to see the first digger pines (*Pinus sabiniana*). Such an un-pinelike looking pine they are with their open-crown habit, their divided, curving trunks and blue-gray foliage! But they do produce splendid big cones that nothing less than a pine could engender. At 3,000 feet near Placerville we found near our camp the straight-growing yellow pines, sugar pines, and a few incense cedars. In the Southern California mountains, these species are met at elevations about 2,000 feet higher. I was surprised here also to find a California jack rabbit—the big-eared, long-legged fellow that I had always associated with open plains country. Here he was, bobbing about in a forest.

At Placerville we were well into the canyon of the American River so we spent most of the next day working up the western slope of the great Sierran crust block. As we approached the summit the road became much less steep—loafing along through the timber at quite an innocent grade, till it suddenly reached the summit of the pass at 7,600 feet.

All at once, there before us was the deep pit of the Tahoe basin reminding us of the Nuuanu Pali back of Honolulu. In sharp contrast with the western slope up which we had been coming most of the day, the eastern side of the crust block was here a regular jumping-off place. Almost under foot was the pit of the Tahoe basin 1,500 feet below. The wide blue lake was set in a large, well-timbered rift valley the floor of which was almost level and appeared a bit dry with Nevada sage among the open forest pines, in contrast with the charming meadow through which we had just passed west of the summit.

It was late afternoon when we reached this "jumping-off place" so we thought it best to jump off without too much time spent in enjoying the view. Down the Myers Grade we went by a rugged road with some 15 per cent pitches and many hairpin turns, but as mentioned, the side winder will tackle anything and we had enough power going down hill. North of Myers Station we turned west across a low moraine by way of a most unrighteously bumpy road into the snugly enclosed basin of Fallen Leaf Lake and there made camp for the summer on Glen Alpine Creek just above its entry into the southwest end of the lake.

Lake Tahoe is a splendid body of limpid blue water but it lacks intimacy. As you look across at the opposite mountains in Nevada, they tend to sink into insignificance. Only as you travel considerable distances by car or by launch nosing into the smaller coves, do you get a truly scenic effect. Fallen Leaf on the other hand is a friendly little lake nestling in the hollow gouged out by an old Ice Age glacier that once plowed its way down Glen Valley to leave, as it vanished, a terminal moraine at the lower end that blocks off Fallen Leaf Lake from the greater Tahoe basin. It is *in* the mountains not beside the mountains. Here for six weeks we reveled in the delights of new scenes, new activities, new outdoor acquaintances. We had "Forded" the Sierra range at one of its lowest passes. Our camp was among pines, silver firs, and the moisture-loving alders, willows, and ferns—all brightened with columbine, lupines, monk's hood, and a host of their smaller associates in color. There was plenty of firewood. Pine needles furnished a carpet and bed springs. A raised platform of stones mortared with sod brought the little camp stove up to a comfortable level for the essential chores. A richly colored columbine, rooted among the stones, sent up its restrained bouquet of blossoms from this "kitchen table" to add its note of cheerfulness. A small tent for emergency when the sky roof developed too many leaks—and our summer housing problem was solved.

A multitude of foot trails radiated from the lake in various directions to the surrounding country so rich in interest for the biologist, the artist, or the mere loafer with outdoor tastes. We really had an ideal situation for our summer of "active idleness."

One great charm of Fallen Leaf Lodge, only a few hundred yards away, was its atmosphere of removal from the too hasty transient. It had been founded by my old friend "Billy" Price. He and Mrs. Price with their two pleasant daughters, managed to keep it a woodsey sort of place. The rough roadway over to the main Tahoe-Placerville route was purposely left a bit discouraging to week-end visitors (and it proved fairly effec-

tive). Plain fare and simple, clean quarters were provided those who wished to stay and enjoy the spirit of the out-of-doors. We of course were camping but we availed ourselves of the small store and post-office facilities at the lodge. We had shipped ahead, by express, some extra supplies which awaited us when we came. Furthermore two of my former students in natural history had spotted the package with our name on it. They had during the previous summer discovered the charm of Fallen Leaf Lake and they were sitting on the package, so to speak, waiting for us.

I kept a diary during the days that followed. From it a few quotations might indicate the liveliness of our interest.

Monday, July 14, 1919.—Climbed up the Tamarack Trail to 7,500 feet where we enjoyed a most wonderful view of Fallen Leaf Lake and the big Tahoe beyond. We were among very fine crags with great talus slopes at their feet where "conies" were abundant. I met this strange little animal for the first time. I have known of him for twenty years but never before had I seen him alive. They live in the mountainous areas of northern Asia and western North America. The proper name is pika or peeka, a native word from the Altai Mountains of Asia. They are little relatives of the rabbits with short ears, short legs, the behavior of big wood rats, and the most remarkable nasal bleat that I ever heard an animal produce though its quality is not unlike the squeal of a cottontail rabbit in distress. The coney uses it as a sort of "bark" that is given at intervals without provocation. The little animals ran about over the rocks at high noon in the warm sunshine. I had supposed them less inclined to bright sun but more of a crepuscular nature like their rabbit cousins. The fur and the odor are distinctly those of rabbits.

A large snowbank lay in a north-facing depression and across the face of it I saw a small dark body moving about. My mind at once leaped to the conclusion of rosy finch, for I had long visualized this, to me, strange bird as doing just that sort of thing. The field glasses, however, showed it to be a tiny chipmunk skittering about. Rather an exposed hunting ground for him, it seemed to me, with all the red-tailed and Cooper's hawks about. We found no trace of the rosy finches (*Leucosticte*) as we climbed to the snowbank.

I was happy to make the acquaintance of several new plants. My first mountain hemlock had royal purple cones that were much like dead ripe prunes though a bit more pointed. *Spirea* was in blossom and the dainty *Pyrola* and, and! the blue gentian! I had never seen it before. I do not know a flower of more wonderfully pure blue than this gentian. They were just opening their buds at this altitude. We saw also some large beds

of forget-me-nots and much of the slender vine maple. The only native maple that I had known heretofore was the large-leaved maple (*Acer macrophylla*) in our Southern California canyons, a 15-year-old seedling of which has formed quite a lusty tree in our yard at home.

July 15.—Today we climbed the Angora trail to the two small lakes of that name. They are most charmingly set against the precipitous base of Angora Peak at an elevation of 7,500 feet. Nighthawks were soaring and plunging dizzily downward to set their flight feathers vibrating and produce the remarkable roaring note that has given the southeastern race its local name of bull bat.

I heard my first songs of the Townsend solitaire. The bird's call notes had long been familiar but not its real song. My first impression was of disappointment—a song that had been overadvertised. It seemed weak but on the other hand it might be called delicate. As I heard it more closely and got a more accurate picture of it, there came into it an Aeolian, fairylike quality and I quite fell in love with its spirituality (or eeriness, which was it?).

The singer would sometimes perch high on a pine top and start his song almost as a whisper which gradually increased in strength till a regular cascade of notes came sifting down through the forest—then it would fade out again. Another one I saw, rose into the air as he sang and continued singing till he drifted back to his original perch, much as our southern mockingbird does and exactly as I had seen the Hawaiian Solitaire (*Phacornis myadestina*) do on the island of Kauai in 1903. The Hawaiian bird is a close relative of ours here.

As we were approaching the lake, a large flock of white pelicans came by so close that we could hear the rush of air across their wings. These great birds, some of them measuring more than eight feet in wing expanse, were doubtless doing just as we had done a few days before—seeking that low spot in the great Sierra barrier over which the Placerville road now comes. They, or their ancestors for a million generations, had probably used that same fly line through the notch in migrating between Pyramid Lake or Great Salt Lake and the waters of the central valley of California.

July 16.—Went back to Angora Lakes today to show them to the family. The effort seemed to prove entirely satisfactory. I took occasion to climb the north side of Angora Peak into a hemlock forest at about 8,000 feet. It was the first time that I had seen these trees in pure stand. Some of them were gnarled, old individuals but always the young tips had that drooping habit that lends a touch of delicacy to this species. They cling to the cold north side of the mountain where much of the time they were

in shadow, which probably accounts for the lack of competition from other forms of coniferous timber. Again I found a scarcity of animal species. A pure stand of pine forest can be almost a desert of animal life. As I came around to the east face of the mountain at the foot of which lie the twin Angora lakes, birds and mammals both became more abundant for the forest opened up and became more diversified. Chipmunks and golden-mantled ground squirrels came into the picture. One of the latter, locally called "copper heads," I discovered about 15 feet up in a small pine. He hurried down to the ground when I approached, however, showing himself to be a true ground squirrel. We seem to find this species only after we reach about 7,000 feet in this region. It is remarkable how scarce the chickarees are. I have seen not one of them away from the immediate vicinity of camp. Probably they are hunted a good deal hereabouts. The altitude seems to make a big difference for this true "tree squirrel." On the road up from Placerville last week, we saw his big brother, the beautiful gray squirrel, at 3,500 to 4,500 feet but there were no chickarees. Here at 6,000–7,500 we find the little chickarees but no gray squirrels.

July 18.—Today I met the gray-crowned leucosticte! For nearly thirty years I have known of this bird and wanted to meet him "on his native heath." Last Monday a little chipmunk skittering about on the face of a snowbank gave me such a thrill and then a disappointment. He behaved so much as I thought a leucosticte should behave. Well, today a leucosticte behaved *just that way* on the first snowbank we came to up the Lake Lucile trail. To the last detail my 30-years' daydream came true as I had pictured him on the face of this snowbank. Two other individuals, however, sat on a stunted hemlock above the snowbank—just as I *hadn't* visualized them. The elevation was 8,300 feet.

It is certainly wonder country up beyond Lake Lucile. We got up on the backbone of the range so to speak and climbed along it for some distance. We looked down westward into the American River canyon and Placerville while a bit north of west we could see into Desolation Valley. The summit is broad and many small ponds remain in basins that had been scooped out of the glaciated granite. They are not large enough to be termed lakes and they have no definite drainage, so become stagnant. They are well populated with gigantic tadpoles and their parents. The timber is almost purely hemlock but there are a few silver pines (*P. mon-ticola*). Red fir grows sparsely on the side hills.

We saw Grass Lake, Lucile, Marjorie, Tamarack, Woods, Fallen Leaf, and Tahoe—one can gather a whole hat full of these mountain lakes in

no time at all. The Desolation Valley country is certainly well named. The entire basin holds about as much soil as a tombstone and the patches of snow that still cling to the sides look like flakes of whitewash remaining on an old wall. We found conies abundant and very tame. One ran out on the rock within reach of my gun barrel and watched me for a long time. (He was not harmed.)

July 21.—Walked up the Tamarack trail alone before breakfast and brought back six mammal specimens. Also heard for the first time a strange birdnote that must have been the call of the pigmy owl. The pitch is higher than the deep-toned whistle of the chipmunk, the interval is longer, and each note is less inflected. I could reproduce it quite accurately and spent some time trying to stimulate the bird to approach but he would not budge from the high, thick fir in which he was hidden. I have long wanted to meet this tiny daylight owl.

The conies were on the cold shady side of the canyon above Lily Lake; and they were quite lively at 7 o'clock. They came out on the rocks within four feet of me though I made quiet movements with hands and head, speaking to them in a low voice.

Got home at 9:15. The director of national parks, Stephen T. Mather, had called by phone from A1 Tahoe station while on a launch ride around the big lake. He wanted me to proceed to Yosemite Valley as soon as possible to act as resident park naturalist for the remainder of the summer. I told him that I would like to talk the matter over with him. Since the launch was soon heading for its home port at Tallac, we arranged to meet at that point at 1 o'clock. Family piled into the "Sidewinder" and we bumped over the seven-mile road to the port just in time to keep the appointment.

Had a very pleasant talk with Mr. Mather but asked to be excused for this summer since I was on vacation with my family. Next year the plan can be put into effect more satisfactorily by laying a foundation for it beforehand. He also wants me to go into the Valley at Christmas-time in order to study the situation at various seasons. It would be too bad if such an activity were begun in a hurried and haphazard fashion.*

July 22.—We took only a short walk today since there were a number of specimens to prepare. The day was marked, however, by the taking of my first crossbill. These birds I had seen 25 years before in the Chiricahua Mountains of Arizona and again here at Fallen Leaf last week but

* In this way was born the Nature Guide Service of the National Parks System. See Carl P. Russell's *One Hundred Years in Yosemite*, p. 138. The movement grew rapidly and now takes in most national parks and monuments and some state parks.

they were always flying high and far. This specimen today was a solitary bird in the gray plumage of youth with a red feather appearing only here and there in his body coat. It was feeding quietly in young tamarack pine timber. The crop contained seeds in the milk stage and a small lepidopterous pupa. The incredible bill with its crossed tip is most fascinating. The bones of the skull are thickened and the neck and leg muscles are strongly developed in harmonious adaptation so that great power may be exerted upon the peculiar bill in twisting apart the scales of green cones to get at the immature seeds. I observed a single spotted sandpiper at Grass Lake—the only water bird yet among all these lakes, except the white pelicans that flew over us at Angora Lakes the other day. It seems to me there should be some species of ducks breeding about these lakes. Lily Lake and Grass Lake would supply them with food and refuge.

July 23.—Alden and I started out for a short jog before breakfast, heading up the Tamarack trail toward the spot where we heard the pigmy owl yesterday morning. We didn't find the owl but the day was so fine we both hated to turn back. I remarked to Alden that if we had a sea biscuit with us, I wouldn't stop short of the summit. Well, we had no biscuit but we kept on going anyway. A short distance above the first snowbank, Alden said casually, "What's that bird over there?" I saw what I took to be a male purple finch feeding among the thimble berry bushes in a steep little cienega. When I picked it up, however, I realized it was a pine grosbeak, one of the species that I had been most anxious to obtain. It made no sound but two other individuals that flew up made notes closely resembling those of the purple finch. My specimen was a male with some few yellow feathers still remaining among the red of the body coat. They really were hardly grosbeaks at all but they appeared to me as merely gigantic purple finches. This was a wholly new species to me.

We kept on going up the steep north slope of the Valley, several times hearing the whistle of marmots and being completely deceived by it at a distance. It sounded like some sort of finch or thrush note that came from thickets of scrub alder nearby. At the summit we swung to the left and climbed the wooded western slope of Angora Peak to 8,600 feet. Only at the very top does the peak break through the forest clothing of hemlock, lodge-pole pine and white barked pine, but to the eastward it drops off abruptly to the lakes basin in unwooded ruggedness. On the boulder-capped summit we found a single rock wren—the only one we have thus far seen in all this wilderness of rock hereabout.

We cruised about for some time through the pleasant forest that was broken here and there with little open meadows bright with yellow flowers

of some composite species. In a thicket of scrubby willows there was a breeding colony of white-crowned sparrows in full song. Their winter note with us in the low country is less vigorous and a little more plaintive than it is here in the mountains. (It also represents a different subspecies.) I was also interested to find the robins very abundant here in this country about 8,000 feet as compared with their almost total absence about our camp at 6,300 feet. Why the difference? Chickadees, juncos, and green-backed goldfinches were the other abundant species, but we also noted mountain quail, Clark crow, and flicker. Those flickers are certainly an adaptable species! Sea level to timber line, desert or river bottom, you are likely to find flickers anywhere. I saw a little, one-room shack out in the desert of Riverside County that had 28 flicker holes drilled in its inch-thick pine walls—all that the birds had to whet their bills on seemingly. In the John Day fossil beds I had found them nesting in the barren cliffs and here they were abundant also in the pleasant forests about Fallen Leaf Lake.

At 11 A.M. we built a tiny fire and toasted some slabs of breast meat from a grouse I had collected for a specimen. No salt, no seasoning except the pitch that came from our tamarack toasting forks. No bread, just grouse meat on a stick Indian-fashion. "On the strength of that meat" we went for three hours longer. Water was supplied by a convenient snow-bank—and we were having a good time, father and son.

July 24.—Fallen Leaf Lodge is a very good place indeed to meet folks who are really lovers of the woods. Although Billy Price was merely a collector of specimens in his boyhood days, he really liked the out-of-doors. The spirit of the naturalist which he always had seems almost to have diffused into the whole personnel of the place. Today there arrived those two public-spirited nature enthusiasts Mr. and Mrs. C. M. Goethe of Sacramento. They had with them Dr. Harold C. Bryant of the State Fish and Game Division and his pleasant family. During July they have been speaking to audiences in the Tahoe region and conducting field trips twice per day—for adults in the mornings and for children in the afternoons. Bryant is doing good work for conservation through education. This is the same type of work that I had done during four different summers in Southern California and Yosemite. I went on the hypothesis that the brain does not have to run in neutral during a vacation. Quite the reverse. A lively, wholesome interest in something new is in itself a vacation and a better understanding leads to a greater appreciation.

So many people are *afraid* of the out-of-doors because they are ignorant of the out-of-doors. Fear is the first-born child of ignorance—or misin-

formation would perhaps be the gentler word to use. If there is a real danger and we are well informed then fear changes to caution or to preparedness. If there is only a fancied danger the fear may change to enjoyment. In my high-school algebra class I learned that, to subtract a minus quantity you merely had to change the sign to plus. So is it in nature appreciation—if you subtract a discomfort or a fear you change the sign and it becomes a positive enjoyment. You have actually gained something and are made happier by being made less unhappy. At least my algebra tells me so.

Today I dissected away the soil from the base of a small pine-drops plant—that strange parasitic cousin of the celebrated snow plant. I found the source of its nourishment. There is a frail attachment to the tiny fibrous roots of the pine-tree host. The contact is easily broken and hence may be overlooked. This fact is doubtless responsible for the contention by some people that these plants are nourished by decayed matter in the soil and therefore are not parasitic. The soil where this one grew was loose, granitic sand on a sloping hillside where little organic matter would be retained. I don't see how they can be less than completely parasitic.

July 27.—Today we started on a more pretentious expedition. We planned to stay out for two days. The start was a bit late because one of the mountain beaver (*Aplodontia*) traps that had been set out last night contained a full-grown male. Since this species was entirely new to me outside the museum, it constituted a great prize and had to be cared for before leaving camp. I salted down the skin and roughed out the skeleton so that it would dry out nicely. We got away at 8 A.M.

We lunched in a beautiful Alpine meadow between Keith Dome and Ralston Peak. The whole trip along the nearly level summit was most enjoyable. Blue asters and lavender daisies were all about. The open glades were dotted with creamy white Mariposa lilies with darker centers. The blooms were nearly two inches across but the stems only three or four inches high so that the flowers seemed to snuggle down to the green meadow like gigantic daisies, and we looked right down into each cup. Just above the 8,000-foot contour we began to find the first Belding ground squirrels. They became quite common about Lake of the Woods where we also found a tiny alpine chipmunk that was much richer in color than those about camp.

Each member of our party had a small pack of concentrated foods of various sorts. There was a primitive log cabin at the lake for shelter, and Billy Price had packed in it some antiquated bed quilts and a kettle or two for the use of hikers, so we managed to make a pretty comfortable

camp. I skinned out some specimens that I collected on the way up so that the carcasses could be used in concocting what the biologist calls "vaudeville stew," that is, a little bit of everything flavored with what have you.

July 28.—The boys and I started out before breakfast to go up to the snowbanks on Ralston Peak. The sun was just turning Pyramid Peak a most wonderful rose color. Omar Khayam would have said:

Wake! For the sun behind yon Eastern height
Hath chased the session of the stars from night
And, to the field of heav'n ascending, strikes
The Sultan's Turret with a shaft of light.

The wind, which had blown all night, was still a bit strong; as we climbed up to look down the western slope of the Sierra it struck us with full force and stinging cold. The pronounced leaning of the hemlock trees along the gentle western slope of Ralston indicated that wind is more or less the rule up there. The view down canyon toward Placerville was lost before the Valley could be seen, for there seemed to be a fog over the low country.

Back to breakfast at 8. Then broke camp and took the trail over to Desolation Valley, thence east cutting across the glaciated mounds to Lake Lucile. Here we spent some time looking for pine grosbeaks and crossbills. The search was in vain but the woods about this small lake are so very delightful! What matters it though one fail in his quest if he gain such delight from his surroundings? We lunched in the Hemlock grove below Lucile, then dropped down the trail to home camp at 3 o'clock. Such a joyous trip it was.

At camp, I found a fine female *Aplodontia* in my traps. A neighbor camper, Mrs. Blanchard, had captured a bushy-tailed woodrat in her kitchen. This is a species that I had looked for in 1894 in Arizona but had never seen. Here in two days we captured three animals that were entirely new to me in the field—*Aplodontia*, belding ground squirrel, and bushy-tailed woodrat. Our southern and desert woodrats have true rat tails. Is it strange that I'm having a wonderful time? One evening at late twilight as we were working about the stove, a soft something swished through the air near my head. A slight plump against the nearby pine trunk was followed by the scratching sound of claws on rough bark that could hardly be interpreted as anything other than flying squirrel. Here again was an animal type I had long heard of but never met. I had forgotten that they might be found in these woods. A large-sized rat trap was therefore set on top of our "kitchen cupboard" that hung against a tree and a dried prune put on the trigger for bait. Prunes must be a wholly

new experience for wild creatures but they seem to have a very strong appeal and a wide one. Anyway my trap was sprung before morning but to my great disappointment it was empty. Of course the trapper is supposed to be hardened to such bad luck, still there was a tremendous reversal of feeling a moment later when I found a beautiful adult flying squirrel lying dead on the ground several yards away—evidently struck on the head by the springing trap but thrown clear of the jaws.

Such a wonderful little creature! One who has not before seen a flying squirrel gets a great thrill from it. Even after 25 years I find that the appeal is hardly less strong with each renewed contact. The large eyes that serve him so well at night are not the staring eyes of many nocturnal animals. Neither are they beady bright but they are soft and expressive. The silky fur is almost chinchillalike in its deep silky pile. The flight web that stretches from wrist to ankle appears, when relaxed, like a beauteous, snugly robe wrapped about him. The tail hairs are a bit stiffer and are parted down the middle both above and below to produce a featherlike vane that might properly be worn by an owl. A most remarkable structure is attached to the wrist. It is a sort of stiffening rod, quite apart from the normal bony skeleton elements, that serves to extend the gliding membrane during flight, supplementing the unusually long arms (long for a squirrel).

In preparing the specimen, I was astonished to discover that the two bones in the forearm have lost their versatility, that is, the radius can no longer rotate about the ulna. Why has nature robbed this tree-climbing animal of a heritage that seemingly he would find so much to his advantage?

August 6.—We climbed Mount Tallac today, leaving at 7:15 and reaching the summit at 12:40 after roaming about for some time in search of the trail above Gilmore Lake. I was greatly interested in the stunted white-barked pines (*Pinus albicaulis*) at timberline. They are a most unpinelike little pine with rich purple cones and gleaming white bark—a perfect delight. No less interesting were the Clark crows who were pecking into the cones to extract the seeds. The birds were as tame as chickadees, flying up out of the grass right underfoot, where they were looking for seeds that they had fumbled, I presume. At the summit also, they came right about us. Here there was a great abundance of flying ants, bees, flies, and the like, presumably carried up there by the upsweeping air currents that centered on the peak. Chipmunks, golden-mantled ground squirrels and several species of the smaller birds were about the summit.

Some of the finest western junipers I ever saw formed a grove near

Lake Gilmore. They reached heights of 40 to 50 feet and were in splendid form, in contrast to the usual weatherbeaten and twisted type.

The climb up the north wall of Glen Alpine Creek was quite worth the while because of the fine view it gave of the whole glaciated valley. The imagination can here recreate the old Pleistocene glacier 2,000 feet thick, that flowed down the valley toward the great basin of Lake Tahoe. Immense arms of rubble, the lateral moraines, now stretch out onto the nearly level basin floor, cradling Fallen Leaf Lake between them, and the mile-wide terminal moraine crosses from arm to arm like a skein of grandmother's yarn to hold the small lake back from the greater. All the way down the bottom of the canyon, rounded hummocks of glaciated granite show between the trees, telling of the slow, grinding flow of uncountable tons of ice that once slid over the resisting rock. Sheep's-back rock (*Roches Moutonnées*), the French Alps people call these hummocks.

Visualizing all this ice, however, could not keep us cool for it was a hot trail up the sunny side of the canyon in the morning hours. The superb view from Tallac Peak, however, was worth all the effort—more than worth it because such a scene will stay with you in memory long after the effort is forgotten.

Found a beautiful specimen of pigmy weasel in my smallest trap this afternoon. It is certainly a wonderful little pigmy and *all weasel*, except that there is almost no odor. I don't believe that any of my captures has pleased me more than this one. For some reason this smallest of our true carnivores appeals to me. He is such a savage little midget! (Like the pigmy owl among the bird tribe.) The stomach contained mammal hair—probably from a deer mouse. I have trapped one other species of weasel near camp. It is larger than the lowland weasel familiar to me from boyhood and it lacks the sharply contrasted black and whitish markings about the face.

Then there were the snow-shoe rabbits that are so different from the big black-tailed jack rabbits of the open country in the lowlands. Up here they are woodland rabbits, most of the time at least. Big granite gray, white-tailed fellows, they have relatively short ears and legs but tremendously expanded hind feet that are clothed with long coarse hair. This gives them the local name of snow-shoe rabbit although a more northern species is also similarly called. My outstanding experience with this animal, however, was one that showed his splendid color protection when out in open ground.

A specimen was very much to be desired so the boys and I made a special excursion to Keith Dome before we were to leave the mountains,

in order to try for a rabbit. We had seen abundant signs there on previous trips and suspected that the rabbits came out into the open at evening time to feed on the short grass that grew among the granite rubble of the almost bare, gently-rounded dome. We arrived at late afternoon, and the three of us spread out in line some 20 feet apart to move slowly across the suspected feeding ground. Sure enough—before we had gone many yards, up jumped an enormous rabbit seemingly right out of the ground in front of the boy farthest from me and disappeared in a slight depression before I could turn and fire. We knew that he hadn't gone far because he would have been easily seen in motion across the opposite slope. He must have flattened down there within 50 yards of us and was relying upon his coat to hide him against the granite background.

We moved cautiously forward until the whole area was in view and stood searching with our eyes, the spot where we knew he must be. All at once Alden exclaimed, "There! I saw him wink his eye!" With that single point to focus on, he could then make out the outlines of the crouching rabbit but see it I could not, despite his efforts at directing me. Finally I slipped a "sparrow charge" of mustard-seed shot into my gun and passed it over to him. We were so near to the animal that this tiny shot bowled it over completely—a great 5-pound rabbit hiding behind nothing but his own coat and his hereditary instinct to keep still. Had the instinct extended as far as the eyelid, it would have proved completely effective.

Our joyous summer was drawing to a close. Nights were becoming cold for thin-blooded campers and calendars are an inexorable device of civilization. Our woodsy camp site was no less woodsy though its smaller flora had changed. The trails were no less delightful, the lake, the valley, the birds, the friendly people—all held for us the strongest attraction but go we must. So camp was set in order and we finally packed the "sidewinder" and on the afternoon of August 19 pulled out across the bumpy moraine road to camp for the night at Tallac on the Lake Tahoe shore. All the following day was spent in a launch ride around the big mile-high lake, playing "tourist" instead of camper.

It was a memorable day but we were quite satisfied to have spent our summer at charming little Fallen Leaf Lake. At 5 P.M. we climbed into the "sidewinder" again and headed south to negotiate the 1,500-foot wall up to the little meadow at the head of American River. There we camped for the night—now really on the way home, downhill all the way to tidewater.

The Proposed Great Basin Range National Park

By WELDON F. HEALD

LAST YEAR, after a little detective work, Albert Marshall and I discovered what we believe to be a hitherto unknown and unsuspected glacier in Nevada's Snake Range. While stalking the ice, which lies hidden deep in the great north cirque of Wheeler Peak, we spent five days knapsacking in as delightful an alpine sky country as we had ever seen. In fact, we were so impressed that I later made the suggestion that the finest part of the Snake Range be included in a national park or monument.

The idea caught on immediately in Nevada and has been favorably received by conservation organizations, such as the Sierra Club, National Parks Association, Wilderness Society, and Desert Protective Council. As a result an active campaign was launched, spearheaded by the White Pine Chamber of Commerce and Mines of Ely, the only local group in a position to undertake such a project. A special committee was formed which has been working enthusiastically to bring about the creation of "The Great Basin Range National Park," as it is tentatively called. Nevada's congressmen and senators have become interested, and statewide publicity has created a general receptiveness with, as yet, little dissent. This situation is refreshingly different from the usual procedure of chambers of commerce, which are, as a rule, opposed to wilderness preservation.

However, fence sitters, doubters, and skeptics exist aplenty. But almost invariably these people have never inspected the area and base their opposition on the general theory that no part of Nevada's eastern desert country is worthy of park status. Unfortunately, too, Lehman Caves National Monument, at the east base of the Snake Range, is mistakenly assumed by some to be the principal basis for the proposed extended area. They argue that gigantic Carlsbad and Mammoth Caves are already two national parks featuring limestone caverns and that a third lesser one is not desirable.

But such arguments are wide of the mark. If the proposed Great Basin Range National Park were established, Lehman Caves would be but one interesting feature, and by no means the most outstanding. The important thing to us who advocate the new area is that it would preserve for all time in its natural state a magnificent and varied mountain country, which is unsurpassed in the Great Basin region.

One of the basic policies of the Park Service is that each unit within the system should exemplify a definite type of scenery and, where possible, every park should be the finest of its kind. So, theoretically each of our twenty-eight national parks is different from the others and all are supreme examples of America's originally rich and diversified wilderness. However, there still remain a number of highly individual and significant types not now adequately represented. One of them is the basin-and-range topography typical of the vast desert region between the Rockies and California's Sierra Nevada. Here are some two hundred separate north-south ranges alternating with wide, arid, treeless valleys. These mountains, so distinctive and important geographically, geologically, botanically, zoologically, and climatically, have become widely known as "Basin Ranges" or "Great Basin Ranges." Yet in spite of their superior scenic, recreational, and scientific attractions, no national park or monument has been set aside specifically to preserve the type. Thus there exists a characteristic Western scenery, now lacking in the national-park system, which should be added while there is time.

The number-one candidate to fill the gap is the Snake Range, situated in east-central Nevada, just west of the Utah line. It is unquestionably the finest of all Great Basin Ranges, and most of the unique features of this widespread family of mountains are best developed there. Stretching from north to south through White Pine County for 80 miles, and 10-15 miles wide, the Snake Range towers abruptly 6,000 to 8,000 feet above Snake Valley on the east and Spring Valley to the west, and culminates in Wheeler Peak, Nevada's second highest point. First known as Jeff Davis Peak, the name was changed to honor the Wheeler survey party that made the first ascent in 1868.

Geologists say that this huge piled-up mountain mass is a typical Great Basin fault-block range, consisting of a vast arch of ancient quartzite thousands of feet thick. However, other rocks are present, with granite intrusions here and there and limestone flanking the lower slopes on both sides. Like many fault blocks, the Snake Range is tilted so that the crest rises directly in a steep escarpment on the west, while the more gradual eastern side has been eroded into a series of transverse ridges separated by deep canyons.

From base to summit are five of North America's seven life zones. These range from Upper Sonoran to Arctic-Alpine — in an airline distance of five miles on the precipitous west side are all climatic and vegetational changes one would come across on a 2,600-mile journey to northern Alaska. Starting on the desert valley floor, at about 5,000 feet elevation, sage-

brush covers the lower mountain slopes. Then comes a transition belt of piñons and junipers between 6,500 and 8,000 feet. Next is a Canadian forest of pines and firs to around 9,500 feet, above which Hudsonian spruces and aspens dominate to timberline, near 11,000 feet. Highest of all is the barren Arctic-Alpine zone that sweeps upward to the lofty cone of Wheeler Peak, 13,063 feet above sea level.

This telescoping of desert, forest, and mountain climates within the space of a few miles is characteristic of the Great Basin Ranges, but nowhere is it more dramatically displayed than on Wheeler Peak. As yet little disturbed by man, the area is a natural zoo, aviary, and botanical garden where animals and plants of the Southwestern deserts, Pacific Coast, and Rocky Mountains meet; among them are rare varieties found only locally. A study of the scrambled and kaleidoscopic ecologies of the Snake Range would be a fascinating enterprise.

But most remarkable is the surprising oasis of superlative alpine scenery perched high above the desert. At the heads of eastside canyons is a series of glacial basins cradled among rugged, snow-streaked peaks and ridges that resemble a piece of the Colorado Rockies dropped into arid Nevada by mistake. It is an exhilarating sky island of dark spruce forests and sunny aspen groves, green meadows spread with wildflowers, jewel-like little lakes, and cascading streams. Also, the area shows outstanding examples of glacial topography, rivaling many greater ranges. Ancient glaciers have gnawed out huge rock-walled cirques in the north and east faces of the summit ridges and sculptured the canyons almost to their lower ends. They also left relatively fresh lateral and terminal moraines on the floors of the basins. A few permanent ice fields still remain in the recesses of the higher cirques. On Wheeler Peak is the only living glacier in the Great Basin region, east of the High Sierra rim.

This alpine country, covering an area of approximately thirty square miles, is too rough for extensive road and resort development and makes an ideal wilderness playground for camping, hiking, climbing, fishing, and exploring. Although little known and seldom visited, it impresses everyone who goes there as profoundly as it did Albert Marshall and me. So there is a small but growing group of Wheeler Peak enthusiasts that sincerely believes some hundred square miles, containing Lehman Caves, the finest eastside canyons, the superb alpine section, and the spectacular western escarpment, would be a unique and significant addition to the National Park System.

Lehman Caves and the Wheeler Peak area have remained in comparative obscurity principally because until recently they were remote from

main routes of travel. Furthermore, the region is sparsely populated, and the copper-mining town of Ely, 62 miles west, is the only sizable community for more than a hundred miles in any direction. But with the completion of hard-surfacing U.S. Highway 6-50 over the Utah desert, a paved transcontinental highway now passes a few miles north and crosses the Snake Range through the wide gap known as Sacramento Pass, 7,159 feet elevation. Already travel has increased greatly, and the number of visitors to Lehman Caves has almost doubled in the past three years.

At the foot of the pass, on the east side of the mountains, paved State Highway 73 branches south and reaches Baker after five miles. This little ranching center is situated at 5,350 feet altitude among green irrigated fields on the edge of broad Snake Valley, with the snow-flecked summits of Wheeler Peak and its satellites soaring grandly to the west. Here are cabins, a general store with limited supplies, a restaurant and a gas station. The Snake Range is included in a detached section of Nevada National Forest, and at the Baker Ranger Station maps and information about campgrounds, trailer accommodations, trails, and fishing streams may be obtained. From the town a paved spur road heads directly for the mountains and gradually ascends Lehman Creek, reaching Lehman Caves National Monument after 6 miles. The road ends at headquarters, pleasantly located at an elevation of 6,825 feet, among piñons and junipers on the lower slopes of the range. Nearby is a picnic ground; accommodations and meals are available.

The monument, with an area of one square mile, was created in 1922 to preserve a singularly beautiful series of underground limestone chambers and corridors discovered by pioneer Absalom Lehman in the 1870's. Guided walks into the lighted caverns are made over an easy half-mile route and require about an hour. Although comparatively small, the caves excel in bristling stalactites, stalagmites, helictites, curtainlike stone formations, fluted columns, thin pillars, and dripping basins, rimmed with terraced dikes. Tiny needle-sharp crystals, peculiar mushroom-shaped nodules, and infinitely varied frosty incrustations adorn the larger formations; and shades of buff, chocolate, and white color some of the rooms. Here is a fantastic subterranean world of pitch blackness where the only sound is the dripping of water, which for many thousands of years has slowly formed the caves and furnished the soluble limes and minerals for the weird Stygian decorations. The imaginations of hundreds of visitors have contributed to the naming of the various rooms and formations — Lake Como, Cypress Swamp, Leaning Tower, Popcorn Hill, Dog Show, and the exquisite, pure white Angel's Wing. Lehman Caves are archaeo-

logically interesting also, for skeletal remains show that prehistoric Indians used them as a burial ground for centuries.

Reports have circulated that these caverns are inferior, unimportant, and not worthy to be in the National Park System. Nothing could be further from the truth. It is true that the developed part is only 1,400 feet long, which makes them pint-sized compared to some of the country's largest limestone caverns. But the value of Lehman Caves is in quality rather than quantity. For there is probably no known cave in America containing a greater concentration of intricate and complicated formations and decorations. Several types, such as the shield formation, are rarely found anywhere else. A report of the Stanford Grotto of the National Speleological Society states that here is one of the most notable examples on the continent of a cave in the process of forming delicate structures, which are in an excellent state of preservation. Mr. Raymond de Saussure, a member of the Western Speleological Institute, wrote me: "The caves themselves are probably the finest to be found in the Western United States. I certainly rank them as the finest commercial limestone caves I have ever seen." And Devereux Butcher, of the National Parks Association, in his book *Exploring Our National Parks and Monuments*, says: "Although smaller than many, Lehman is considered by some people to be the most beautiful cave in our country."

Despite meager funds, the Park Service has done an excellent job of administering the monument. However, with increased appropriations under the new Mission 66 project, it is hoped that facilities will be greatly improved. The most pressing need is for an artificial exit at the end of the cave so that visitors will not have to return over the same trail to the entrance. If this were done, more than twice the number of people could visit the cave at the same time.

The monument is located between two eastside canyons, which lead up to the high country around Wheeler Peak. In both are Forest Service campgrounds reached by fair dirt roads. Lehman Creek canyon, to the north, is the most popular approach, and the campgrounds, with eighteen recently completed trailer spaces, is 3 miles from monument headquarters at an elevation of 8,000 feet. This is the starting point of the 8-mile Wheeler Peak trail.

A more delightful and varied hike would be hard to find. The route ascends the canyon beside foaming Lehman Creek, passing through aspen groves alternating with shady woods of white and Douglas fir, and grassy openings bright with Indian paintbrush, lupines, and other wildflowers. Now and then the trail loops up sunny slopes of piñon, manzanita, and

mountain mahogany. Some of the latter are giants, 40 feet high with trunks more than a foot in diameter. In about 4 miles the high glacial basin is reached and the scenery becomes alpine. Here the precipitous north face of Wheeler Peak rises impressively 4,000 feet above gently sloping meadows bordered by tall pointed Engelmann spruce. On the rocky rims above are fine stands of bristlecone pines, and the aspens go to timberline, where they form extensive mat-like thickets not more than a foot high.

At Stella Lake, largest of the three moraine lakes at the head of Lehman Creek, the trail tackles the headwall and surmounts the crest of the Snake Range. Beyond the last wind-whipped spruces and limber pines, it follows the bleak arctic ridge upward to the steep summit cone. On both sides the slopes plunge down to the desert, thousands of feet below, and range after range of mountains recede to the distant horizon. But even here miniature alpine gardens bloom amidst the waste of rocks, and the cheery blue blossoms of polemonium brighten the way almost to the top.

The view from the wedge-shaped summit of Wheeler Peak is magnificent. It commands a 360-degree panorama embracing thousands of square miles of deserts, valleys, hills, and mountains in eastern Nevada and western Utah. But perhaps most impressive is the close-up of peaks, ridges, cirques, basins, and canyons of the Snake Range itself, stretching southward in jumbled confusion.

Strangely enough, however, the Wheeler Peak glacier cannot be seen from the Lehman Creek basin, nor even from the summit. Although the jagged rim and sheer rock walls of the great north cirque are the most prominent features of the landscape, the floor remains persistently hidden from all points outside. That is undoubtedly why the glacier wasn't discovered until 1955. The cirque must actually be entered to see it, and there is no particular reason to suppose that anyone had done so before then.

My curiosity was first aroused some years ago by an article in an old U.S. Geological Survey annual report. It described a body of ice on Wheeler Peak seen in 1883 by Mr. William Eimbeck of the Coast and Geodetic Survey. But he gave few details and no intimation that it might be an active glacier, and he obviously didn't enter the cirque. My interest was further stimulated by an examination of air photographs, and by a distant view of Wheeler Peak's north face while crossing Sacramento Pass in 1947. Time didn't permit investigation then, but I felt certain that some of the ice remained. I resolved to have a closer look at the earliest opportunity.

Eight years passed before I was able to satisfy my curiosity. But finally last September, with Albert Marshall, companion on many previous mountain jaunts, I ascended Lehman Creek canyon and camped in the glacial basin at its head. We spent several days exploring the high country, climbed Wheeler Peak and descended the north face far enough to see ice, and eventually made our way into the great north cirque. This proved to be as arduous an expedition as Albert and I had ever undertaken together. But when we passed the portal-like cliffs and saw into the cirque, we both shouted at once. For there before us, cradled in the gigantic rock basin, was not just ice, but an active glacier. All the signs of moving ice were readily apparent—névé, bergschrunds, crevasses, and fresh moraines. True, this was no giant river of ice. It was triangular in shape, and its greatest dimension probably didn't exceed 2,000 feet. But the wonder was that it should be there at all in the midst of the Nevada desert. We thought it deserved a name. Later, after discussion with various interested people and organizations, I made application to the Board on Geographic Names that it be officially designated the Matthes Glacier, after François Emile Matthes (1874–1948), one of America's most distinguished glacial geologists.

Albert and I were particularly struck by the awesome and spectacular nature of the place. Bearing a remarkable resemblance to the east face of Longs Peak, it rivals that famed Colorado cirque in size and grandeur, and its glacier is much larger and more impressive. The enclosing walls rise in a horseshoe of great cliffs, 1,500 to 2,000 feet high, with Wheeler Peak soaring at the head in an unbroken, almost perpendicular precipice. Not a tree or shrub can be seen and the place seems as remote and lifeless as the moon. Guarded as it is by endless rock piles in an unbelievable state of instability, building a trail there would be a prodigious task.

Baker Creek canyon, to the south of the monument, penetrates the range to the divide just south of Wheeler Peak. The country has greater variety than Lehman Creek basin and in many ways is even more scenic. A 2-mile dirt road leads to the campground, starting point of the trail. In the lower canyon are fine stands of ponderosa pines, and at the so-called narrows are undeveloped limestone caves, recently explored by speleologists. The creek heads in two huge cirques, divided by the jutting prow of Baker Peak, about 12,300 feet elevation, with the sweeping southern slopes of Wheeler to the north and symmetrical Pyramid Peak, 11,921 feet, to the south. Embedded in the southern cirque, eight miles from the campground, is spruce-fringed Treasure Lake, backed by the sheer cliffs of the divide. From here a trail climbs above timberline over

Island



Island in a Sea of Sage and Playa

Containing what is generally considered Nevada's outstanding scenic resource, the Snake Range rises abruptly from the desert to culminate in Wheeler Peak (13,061 feet), which shelters the only active glacier between the Rockies and the Sierra Nevada; the range contains, within Lehman Caves National Monument, one of the country's most beautiful systems of caverns.

photographs by WELDON F. HEALD AND PHILIP HYDE



Stella Lake, at timberline among the high peaks, is one of the three moraine lakes in upper Lehman Creek basin.



Aspen forest on the trail
to Stella Lake, Nevada
National Forest.



The jagged rim of Wheeler Peak's great north cirque rises four thousand feet above green meadows bordered by tall pointed Engelmann spruce.

FIRST AND LAST PHOTOGRAPHS BY HEALD; OTHERS BY HYDE

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the ridge south to Johnson Lake, at the head of Snake Creek canyon. This, too, is a small cirque lake amidst grand alpine surroundings. It may also be reached by a mountain dirt road up Snake Creek, ending one to four miles below, depending on whether a passenger car, truck, or jeep is used. From Johnson Lake another trail loops back over the ridge to Baker Creek through some of the finest sky country in the Snake Range. On the way are delightful mountain-top meadows, high, slanting forests, and tremendous views of the peaks on the divide and east out over the Utah desert to the Wasatch Range on the horizon, 125 miles away.

South of Snake Creek the crest declines in altitude, although still well above timberline. However, those who know the country say that some of the most spectacular canyons and rock formations are in the southern part of the range. Hence a careful inspection of the whole area should be made before an arbitrary southern limit is placed on any proposed national park or monument. A combined Park Service and Forest Service party was scheduled to visit the Lehman Caves-Wheeler Peak area for three days during the summer of 1956, to determine its suitability for park purposes. But the time is too brief for more than a quick preliminary survey, and we hope that a more thorough examination can be made in the near future. Other questions are being taken up and given thoughtful consideration, such as the objections of stockmen and sportsmen, who are against national-park extensions and additions. Also the feeling of the Forest Service about transferring a part of Nevada National Forest is an important factor. But all in all, heartening progress has been made since the "Great Basin Range National Park" was first proposed in September, 1955.

In 1955 our national parks, monuments, and recreational areas had 46,000,000 visitors. By 1970 that number will be doubled. Under the provisions of the Park Service's Mission 66, more adequate and modern facilities will be provided in the present national parks. But that is not enough. We must also keep pace with the country's growth by adding new park areas for the enjoyment, education, and inspiration of future Americans, who will live in an age of even greater congestion, speed, and tension than ours. As population grows and fast-paced modern civilization encroaches upon our last remnants of original wilderness, we will increasingly need such unspoiled outdoor recreation areas as this high inspiring country around Wheeler Peak and its glacier.

Your Stake in Alaska's Wildlife and Wilderness

By LOWELL SUMNER

FOREWORD

The problem of assessing the economic worth of our wildlife resources has been a vexing one for many years. The core of the problem lies in the need to express value in terms of the almighty dollar. Thus, intangible values, though admittedly important, have suffered for the lack of suitable yardsticks. Mr. Sumner has here provided one such yardstick which, I am sure, will find wide application.

His method places a value of over \$21,000,000 on the time spent on recreational hunting and fishing in Alaska in the period July 1, 1953, to June 30, 1954. This amount is substantially greater than the value estimated by other means for the same period. Furthermore, it is an additional amount. Mr. Sumner is to be congratulated for his new, realistic approach to measuring the immeasurable!

To accentuate the speed with which changes occur in Alaska today, we can mention the construction of a winter road extending from Circle on the Yukon River to the Arctic coast near the Blow River. The road was planned, built, and in use by highway-type, tractor-trailer trucks in less than four months; and this in the area Mr. Sumner previously considered as the only remaining region suitable for retention as a pure wilderness!

We will, indeed, have to speed up our conservation planning and active programs if we are even to remain abreast of the times. Mr. Sumner's report should bring about some of the needed acceleration. May it receive as wide distribution as it should have.

JOHN L. BUCKLEY

Associate Professor of Wildlife Management
University of Alaska

IF WILDERNESS and wildlife mean much to you, then you have a stake in Alaska, our last frontier. This stake is shared by many groups of people of widely divergent interests. Yet if all who are united by some form of dependence on this frontier wildlife will work together, this vital resource can be perpetuated indefinitely in something like its present richness.

In 1951-1953 as part of the National Park Service's Alaska Recreation Survey headed by George L. Collins, the writer completed a preliminary biological survey of most of the Territory except the Aleutian Islands. Readers may recall that unique values of certain of Alaska's fabulous wilderness areas were described in an article in the 1952 *Sierra Club Bulletin* entitled "Magnificent Katmai," and in another in the 1953 *Bulletin* entitled "Northeast Arctic—The Last Great Wilderness." In 1953 the Arctic was more intensively studied, and the results summarized in an article, "Arctic Wilderness," in the winter, 1953-54, issue of *The Living Wilderness*.

These surveys led to the conclusion that Alaska's magnificent biological resources already have been altered and decimated by frontier practices similar to those which a hundred years ago laid waste the forests and wildlife of the United States. Equally important was the conclusion that in Alaska it is not yet too late to manage these resources wisely.

The Office of Naval Research in 1952 and 1953 made possible, through the Arctic Research Laboratory at Point Barrow, the surveys of the Arctic. The U.S. Geological Survey furnished valuable assistance in the Arctic surveys, and reviewed the mineral evaluations used in this report. Regional Director Clarence J. Rhode of the Fish and Wildlife Service arranged for a flight into the Arctic and air transportation to other parts of Alaska. The U.S. Forest Service was similarly generous in supplying transportation in southeastern Alaska, and estimates for forest product revenues, current and future. Dr. John L. Buckley, who is Associate Professor of Wildlife Management, University of Alaska, and also Biologist for the Fish and Wildlife Service, gave much valuable information based on his own program of wildlife investigations, which were carried out independently of ours. His findings subsequently have been summarized in his recent publication, *Wildlife in the Economy of Alaska* (1955), in which the conclusions strikingly parallel our own.

Mr. Hugh A. Johnson, head of the Department of Agricultural Economics, Alaska Agricultural Experiment Station, assisted us with the estimates of current agricultural revenue, and forecasts. Mr. Anthony W. Smith, executive secretary, C.I.O. subcommittee on conservation, per-

formed the important service of reviewing our monetary evaluation of vacationists' time.

Special thanks are due to Doris E. Carlton, National Park Service economist, who painstakingly clarified for the writer some of the pitfalls which threaten anyone who tries to measure the immeasurable. If any economic heresy remains in the conclusions here presented, sole responsibility rests with the writer.

The splendid wildlife photographs by Warren Steenbergh and Charles J. Ott of Mount McKinley National Park may emphasize some of the wildlife values which are beyond dollars, and thereby stimulate others to journey north to reap their own harvest of photographic trophies and memories of Alaska's superlative wilderness and wildlife.

A VITAL RESOURCE IN A UNIQUE SETTING

Alaska's wilderness is the result of a unique combination of climate, soils, waters, and topography. There never was, even in frontier days, any large-scale ecological parallel in the primeval areas of the United States. For this reason the pattern of available natural resources in Alaska, the related possibilities of land use, and the revenues therefrom, are basically different from those of the United States. And, fortunately, by the same token the prospects for conserving Alaska's primeval values are brighter.

Further industrial development of Alaska is assured, but industrial plants in themselves occupy or permanently change only a relatively small part of the land. It is true that in the States, extensive suburban areas have grown up around many industrial centers and have changed a large surrounding zone. However, future industry of the type which Alaska's natural resources seem able to support promises to be highly mechanized. Therefore, it is unlikely that suburban development will contribute greatly to large metropolitan centers in the Territory.

In the States intensive, large-scale agriculture, rather than industrial development, has been the greatest foe of wildlife and wilderness, by transforming enormous areas of the continent into crop lands from which natural conditions are virtually excluded. But, before this kind of agriculture could occupy an extensive part of Alaska, the polar regions of the earth would have to warm up appreciably and permanently, and the gradual evolution of Alaskan soil types would have to continue for centuries. This is the situation underlying the significant fact that in Alaska fish and wildlife is and promises indefinitely to be a major resource—provided it is wisely managed.

SOME DOLLAR VALUES

If you love wildlife and wilderness for their own sake, discussion of dollar values can appear tedious or beside the point. But some understanding of these values seems essential so that those whose livelihood depends directly on wildlife and those who use and enjoy it less directly can join in working for its conservation.

At the present time, actual dollar revenue to the nation derived from Alaska's fish and wildlife is \$121,641,500 annually. This is the combined revenue from commercial fishing, sealing, trapping, manufactured ivory, money spent by hunters and anglers, the value of wildlife that is used for food in native villages, plus expenditures by tourists that can be attributed to the drawing power of wildlife (Buckley, pp. iii, 3-4). This wildlife revenue is three times as great as the combined dollar revenue received from all the Territory's other natural resources as the following figures show: The second most important industry—mining, greatly shrunken from the level of gold-rush days—yields \$24,252,000 annually (Bureau of Mines, 1954) or about 20 per cent of the fish and wildlife income. The tourist industry as a whole, with an annual revenue in 1952 of \$6,336,400 (Stanton, 1953, p. 49), ordinarily would be considered third in importance. But for present purposes, as further outlined below, we make a distinction between those tourists who are attracted by Alaska's wildlife—hence already counted above—and those presumed to be relatively uninterested in wildlife. On this basis annual revenue from forest products at \$5,000,000 takes third place. Revenue from tourists not attributable to wildlife then takes fourth place at \$4,677,000, agriculture revenues fifth place at \$3,080,000, and hydroelectric sales sixth at \$1,750,000 (Federal Power Commission, 1950).

As Alaska's economic development becomes more complete, other resources will contribute an increasing share to the rising total income derived from the Territory. Nevertheless the Department of Interior's Alaska Field Committee shows (1951, p. 1) that the dominance of fish and wildlife in the economic life of the region probably will remain substantially unchanged. Using their estimates for 1961, plus our own evaluation of the essential contribution of wildlife to the growing tourist industry (estimated by the National Park Service to total \$20,000,000 annually, by 1961, approximately one-fourth attributed by this writer to wildlife) there is indicated a total revenue from fish and wildlife of around \$158,250,000 for that year.

The ecologists Leopold and Darling (1953) in a comparative analysis of the Territory's wildlife and other resources, reached essentially the

same conclusion. They emphasized that for this reason, and in contrast to what has happened in the United States, the management, protection, and utilization of fish and wildlife in Alaska necessarily will remain a major industry, a distinction which should be adequately considered in all land-use planning.

The total annual revenue from wildlife, often called "the commercial or business value" by economists, is a valid measuring stick as far as it goes. But the fact that in Alaska this revenue is three times as great as that derived from all other natural resources is due to the peculiarities of the Alaskan environment. Application of this limited scale of values to other parts of the nation does not yield satisfactory results, therefore a better measuring stick should be sought.

VALUES BEYOND DOLLARS

Only a part of the wildlife resource can actually be bought or sold to produce income. There is a substantial remainder which, like sunshine or happiness, provides an "intangible value" that cannot be fully expressed in dollars. Perhaps "immeasurable" is a better word than "intangible," for the resulting satisfactions often are very obvious and tangible.

Attempting to measure the immeasurable is a formidable undertaking. But defenders of wildlife and wilderness desperately need a better measuring stick to show the importance of their scale of values against the opposing dollar scale that often is set up in support of programs to log and graze, or build roads, dams, or chair lifts in primeval wildlife areas. They will continue to lose on many issues until their scale of values can be more adequately presented. As a matter of fact some progress is being made in more strongly presenting their position, and the right combination of realism with imagination should bring further results.

Attempts to measure the recreational value of wildlife illustrates the problem. The annual expenditures made by people for their recreational use of wildlife often are used as a partial measure of this value. For Alaska this figure amounts to \$17,487,600 annually (and is included among the various wildlife revenues which previously have been shown to total \$121,641,500). It represents expenditures by hunters and anglers, plus tourists who did not hunt or fish but who nevertheless were considered to have been drawn to Alaska by its wildlife.

However, the figure does not include substantial expenditures made by Alaskan visitors before their departure from the States. Of the \$17,487,600, hunters and anglers spend approximately \$16,157,000 (Buckley, pp. 3-4) and the balance of \$1,330,600, is estimated by this writer to be

spent by that segment of Alaska's nonhunting and nonangling visitors who are attracted to the Territory by its wildlife.¹

Although \$17,487,600 is an impressive sum, it is merely the money received for the merchandise, food, lodging, licenses, transportation and related services purchased by certain classes of persons in connection with wildlife during their vacation outings. It does not evaluate the "immeasurable" but enduring satisfactions, the relaxation, education, and inspiration, that in the minds of these vacationists must usually far outweigh the cash value of the various things that they purchased along the way. Nor does this dollar value indicate what economists call "the social value" of the resource, which is the value to society as a whole in terms of health, education, and restored human effectiveness. Yet an economist (Black) points out that these social values "are as truly economic values as any that can be named. They are merely measured from the standpoint of society or the nation rather than the individual, and the purview is much longer in consequence."

IN SEARCH OF A BETTER MEASURING STICK

In developing a better measuring stick for wildlife and wilderness values, some basic economic concepts may prove helpful: "What people spend, both their money and their time, is input. . . . The satisfactions obtained are output, and it is output that this project [our analysis of wildlife values] seeks to measure" (Black, p. 274).

In other words the basic objective should be to measure the value of the satisfaction (*output*) derived from wildlife. But since no direct way of measuring satisfaction so far has been found, many workers in the field measure instead the expenditures in that connection which people make in money and time, even though this is really *input*. To justify this substitution, users of this measuring stick have assumed, not unreason-

¹ This figure was computed by this writer from questionnaires and studies conducted for the National Park Service by Stanton which show that nonhunters and nonanglers spent around \$5,322,500 during their Alaska vacations. A rough estimate of visitor motivation independently arrived at by Buckley (p. 27) and this writer concludes that Alaskan wildlife supplies at least one quarter of the motivation for these nonhunters and nonanglers. This does not prove that wildlife accounts for a quarter of visitor expenditures, but this crude apportionment seems reasonable for present purposes when one considers that the more extended and expensive trips are in general the ones which offer the most inducement in terms of wildlife. One quarter of \$5,322,596 gives \$1,330,649 as the minimum expenditure by visiting nonhunters and nonanglers that is attributable to wildlife. It does not include expenditures by resident nonhunters and nonanglers that are attributable to wildlife, because no figures for this class of persons are available.

ably, that the value of the output (satisfaction) at least equals the value of the input (money and time). Otherwise people would not go on spending their money and time on that form of recreation.

We have noted that dollar expenditures give an incomplete evaluation of the associated inspiration, education, and restored human effectiveness—to the individual and to society—because the value of these “immeasurables” far outweighs the cash value of things purchased during the trip. How then does this examination of the economic equation help? By showing that expenditure (input) is to be measured not only by money but by *time*—your vacation time. Thus a new scale, or at least one not usually taken into account, has been added—provided we can find a way to measure this time component.

THE VALUE OF YOUR VACATION TIME

How much is your vacation time worth? Would you be willing to sell it? If so for how much? All of it or only a part?

Some of us count the weeks throughout the year in anticipation of some long-cherished vacation project—perhaps a trip to Alaska. Often we would not give up that project for any amount of money.²

Or we might grudgingly sell our vacation time for a thousand dollars, but in the mind of a professional economist there might be a suspicion that our attitude in this case was subjective. Therefore in trying to improve our measuring stick, a look at the prevailing compensation wage rates for overtime and vacation time seems in order.

Under present conditions a person sometimes can be persuaded to work beyond his normal daily schedule, or at unusual hours, if he is paid at time-and-a-half rates. But if the overtime extends beyond his regular work week into his Sundays and holidays, which he considers to be specially his own for rest, relaxation, and inspiration, he receives double the regular pay rate—in many industries at least—and the trend is toward extending this holiday double-time pay rate to all types of work. An annual vacation might be expected to rate an even higher hourly valuation in the mind of the individual because it offers a solid block of time that makes possible vacation goals that otherwise could not be achieved.

The double-time wage rate then might be taken as a reasonable minimum measure of what the average person considers his relaxation time

² Of course we might do so if there were emergency medical expenses, or if the boss threatened to fire us, but this suggestion is irrelevant; for if subjected to sufficient pressure, we would also hand over a highly valued watch or camera to a pawnbroker or highwayman, without lessening the value we placed on these possessions.

to be worth even if he uses it just to stay at home. Mr. Anthony W. Smith, executive secretary, C.I.O. subcommittee on conservation, has (in a letter of February 7, 1955) supported this reasoning. Perhaps an economist might question whether retired folk, or family members other than the head of the household should be allowed to claim this same value.

But is a wife's vacation less valuable than that of her husband? Is the educational experience of a child which enriches his outlook for life worth less to society than that of the parents? Should the vacation experience of a retired person, the reward of a lifetime of work and saving, be downgraded? I cannot see why this should be so; nevertheless, to be conservative I will for present purposes use only the straight-time wage rate computation. However, it will be applied here to all vacationists, irrespective of occupation, sex, age, or color of hair.

Now to try out this revised measuring stick on Alaska's fish and wildlife: Buckley (pp. 3-4) has shown that hunters and anglers annually devote approximately 855,900 man-days to their sport. (I have excluded his figure for trapping as being a subsistence activity, not primarily recreation.) In computing the approximate value per hour of this vacation time it appears fair to take \$3 per hour as an arbitrary average wage rate among the executives, clerical workers, doctors, teachers, lawyers, foremen, and skilled workers who visit Alaska. And considering the high wage rates that prevail within the Territory, the same average would seem to apply to the vacation time of Alaska residents.

On the basis of an eight-hour day (is one's enjoyment of a vacation really limited to only eight hours of each day?) 855,900 man-days, or 6,847,200 man-hours, times \$3 per hour equals a vacation-time value of \$20,541,600. This is a value substantially greater than and additional to the \$16,157,000 in cash expenditures by these same people (Buckley, pp. 3-4). Similarly, questionnaires and studies conducted for the National Park Service by Stanton (1953, pp. 40-41) indicate that Alaska's non-hunting and nonangling visitors who were attracted by its wildlife expended 34,920 man-days at a vacation-time value of \$838,200.³

Adding together the vacation-time values of these two groups of people—those who take wildlife and those who observe and photograph it—

³ Computed on the basis that 17,037 nonhunters and nonanglers spent an average of 8.2 days in Alaska (Stanton, pp. 40-41). As previously, the concept that Alaska wildlife supplies one-fourth of the visitor motivation was applied; hence, crudely, the assumption was made that one-fourth of the total time expenditure was attributable to wildlife. On this basis $17,037 \text{ persons} \times 82 \text{ days} \times 8 \text{ hours per day} \times \3 per hour , divided by 4, gives \$838,200.

gives a total vacation-time valuation of \$21,379,800 attributable to wildlife. To this in turn we add the previous dollar expenditure of \$17,487,600 for a grand total of \$38,867,400 of expenditures in *money and time*. Thus we have more than doubled the economic value of the wildlife resources.

Besides, the tourist or vacation industry is undoubtedly still in its infancy in Alaska and an enormous increase will take place in the years ahead. One needs only to compare the present 10,000,000,000 dollar U.S. tourist industry with its small beginnings to appreciate the opportunities for Alaska.

Again, however, the real value of wildlife cannot be expressed solely by the time and the cash required to reach its haunts, and to study, photograph, or capture it, any more than the value of education can be measured merely by tuition fees, transportation costs, and months of study; or the worth of religion by one's contributions to the collection plate and time spent inside the church.

WHILE WAITING FOR A BETTER PIECE OF STRING

Certainly we need better data for this kind of valuation than seem to be available at present. Therefore it is impossible at this stage to measure the value of wildlife and wilderness to society as a whole, although some suspect that this value may prove to be the greatest of them all.

No doubt additional information can be obtained through questionnaires. But our present revised measuring stick, even if still "short on one end," seems better than none. It can be shortened, or lengthened further by including the double-time concept, without materially altering the relative values discussed. Perhaps we are in the position of one who, confronted with a lake of unknown depth, has pieced together a 300-foot length of string to take soundings. A bystander may say, "your string is not long enough." To which we reply, "Yes, but time's a-wasting. Let's get out in the boat and chart everything to a depth of 300 feet at least—while waiting for a better piece of string."

YOUR STAKE DEPLETED?

A cynic has said that the only thing we learn from history is that we learn nothing from history.

It would surely be both tragic and stupid if in Alaska we were to repeat past mistakes and waste land resources the way we did in other regions. Yet, in Alaska the depletion of fish and game and the repeated burning of vast forests have begun to parallel the history of destruction and extermination on the United States frontier a hundred years ago.

In both regions the pioneers found such a wealth of natural resources that conservation seldom entered anyone's thoughts. Unrestricted use, or misuse, of fish, game, and forests by the first few settlers did comparatively little harm. But from the earliest times the history of mankind has proved around the world that biological wealth, no matter how great, cannot last when the unrestricted exploitation of a pioneer society is multiplied and compounded by a great increase of the human population. Today the tide of settlement which swept across the United States from the Atlantic to the Pacific coasts, filling up and changing the open spaces, has turned north, and the first waves are reaching Alaska.

Fifty years ago Alaska's enormous herds of caribou were comparable to buffalo that swarmed on U.S. plains in earlier times. Today most of these caribou herds have shrunk to a fraction of their former numbers. They disappeared from the Kenai peninsula when the two great fires of 1871 and 1891 destroyed the slow-growing lichens that were their vital winter food supply. In other accessible parts of Alaska, overhunting took a heavy toll in the early years, but it now appears that here also the decline of the animals was brought about primarily through widespread destruction of their lichen ranges (Leopold and Darling).

In the interior of Alaska, as on the Kenai peninsula, the lichens were killed by man-caused fires, which even in recent times have devastated up to 5,000,000 acres a year. Along the west coast north of the Alaska peninsula a parallel destruction of the caribous' food supply was caused by overgrazing on the part of the domestic reindeer industry, which also depended on the lichens. This industry collapsed in the 1930's after it destroyed the natural forage supply upon which it depended, just as the pioneer U.S. cattle industry went from boom to bust in the Great Plains and Northwest in 1886, through overstocking—and again in 1893 when the cattle industry allowed history to repeat itself on the overstocked ranges of the Southwest (National Park Service, 1950, pp. 62-63).

However, the climatic differences between the United States and Alaska again figure in the grazing picture: In the States, grass may recover fairly well in 5 to 15 years if the range is carefully used, but in Alaska, following a severe fire or prolonged overgrazing by reindeer, lichens may require up to 100 years for recovery, and, after repeated fires, much longer.

At present, the nearly treeless Arctic, which does not burn, still supports caribou in primeval numbers, except along the west coast where reindeer have removed the lichens. There are still no accurate figures for the number of caribou occurring in Alaska, but Buckley has estimated conservatively (in reviewing the present report) that the Arctic caribou

herds now number approximately 150,000 animals, compared with approximately 100,000 in all other parts of Alaska.

Four-fifths of the original spruce stand of interior Alaska has been wiped out since its acquisition by the United States, and man-caused fires still destroy approximately a million acres of the interior forest each year. Forest destruction has been so profound and widespread that the general appearance of the landscape, as well as its ecology, has been materially altered. Large areas have been rendered treeless for years to come, and the remainder has suffered extensive replacement of large trees valuable as timber, such as the white spruce, by smaller, less valuable types such as aspen, birch, and balsam cottonwood.

Fifty years ago, white spruce forests with 20-inch trunks were common, but it is doubtful that many third-generation Alaskans will even be aware of this lost wealth. The seriousness of forest-fire losses in the interior of Alaska, both to wildlife and to human beings, is accentuated by the slow recovery rate, as in lichens, resulting from the rigorous climatic conditions. H. J. Lutz points out that when a white-spruce forest is destroyed by a severe fire it may not again produce logs suitable for building purposes for 100 to 200 years.

The musk ox was exterminated from Alaska about 85 years ago, and now occurs in the Territory only on Nunivak Island, having been reintroduced from Greenland.

Commercial fishing operations have for many years been Alaska's largest single source of revenue, and still provide more than 85 per cent of the entire nation's salmon pack. Nevertheless, this vital industry faces an uncertain future. The fishing gear continues to increase in size, mobility, and effectiveness; likewise, there has been a steady increase in the number of fishermen, and in the size of the fish-consuming population of Alaska and the States. But the salmon have declined since the beginning of the present century. In recent years the salmon fishing in many areas has become so poor that the industry is deeply worried. Yet the history of the nearly defunct California sardine industry, which resisted conservation regulation (Crocker), is being repeated. The Fish and Wildlife Service in Alaska has been bitterly resisted for trying to bring the annual salmon catch into balance with the annual rate of reproduction of the fish. Estimates of the commercial fishing industry's continued existence at approximately present levels are dependent upon two assumptions—that the industry will agree to adequate self-regulation before it is too late, and that markets and harvesting methods will be developed for other Alaskan food fishes which have not previously been utilized on a large scale.

Increasing industrialization in Alaska may introduce still more complications for the salmon, as Albert M. Day has warned. The dumping of pulp and mine wastes into the rivers of the United States was as disastrous to the salmon runs there as it was avoidable. This history may repeat itself in Alaska unless the economic value of the fishery is fully recognized *at the beginning*, so that adequate protection measures can be taken before it is too late. Likewise, the ruination of Alaskan salmon runs by dam construction can be avoided by adequate advance planning, but only if the people actively promote and support such planning.

It would be unfair to imply that fish and wildlife is everywhere on the downgrade in Alaska, or that the downward trend cannot be stopped by determined people. Some declines have been slowed down or halted; several species have been rescued from virtual extinction. Coastal Alaska's more favorable environment has made it possible for its wildlife species to recover from the severe depletion of earlier days. Since ocean forage supplies are immune to fire and overgrazing, the fur seal was able to make an excellent recovery when the annual take was brought into balance with the annual rate of reproduction. The sea otter also has increased, and whales and walrus have so far fairly well withstood present-day hunting methods.

The coastal forests are nearly fireproof, owing to the dampness of the climate. However, large-scale logging for the expanding pulp industry eventually will profoundly change the appearance of some of southeastern Alaska's finest coastal scenery. Adequate thought will have to be given to the increasing need of society for such unlogged, primeval country.

In the interior, moose habitat has been increased by the fires, notably on the Kenai peninsula and in the Susitna Valley, where lichens have been replaced by browse plants. In addition, a slight warming of the Arctic regions apparently has produced a gradual increase of the moose and their browse plants in northern Alaska. Their boggy thicket habitat and solitary tendencies make moose less vulnerable to hunting than caribou.

Interior Alaska's Dall sheep (bighorn) were a favorite source of food in gold-rush days, and have had their ups and downs. Though not able to maintain their original numbers in the more accessible ranges, they appear to be holding their own in their primeval stronghold, the Brooks Range, and have shown excellent recovery from previous low numbers in Mount McKinley National Park and certain other areas. Occasional severe winters seem to have more effect on their numbers than man or predators.

Fur animals, likewise, appear to be holding their own reasonably well under present management practices. The decline from earlier days in the take of wild furs and in their market value seems due mainly to the changing demands of fashion, the competition of fur farms, substitution by the industry of cheaper and more abundant furs such as muskrat and rabbit, and the growing scarcity of white settlers willing to endure a trapper's hardships, isolation, and privations for the comparatively small financial return.

The huge trout and steelhead that have made the Territory famous still seem abundant by the standards of a United States which has forgotten the primeval fishing heritage it lost a hundred years ago. But Alaska sports fishing declined in many areas when World War II brought an enormous increase of visiting fishermen. Air travel continues to spread this increased pressure and gradual depletion, even to such remote waters as those of Lakes Schrader and Peters on the north slope of the Brooks Range.

Measures which have succeeded in slowing some of the downward trends are encouraging so far as they go. Some surpluses have developed in certain local areas, as in the moose of the Kenai and Susitna; hunting is not at present keeping up with the production of deer in the Southeast, or of caribou in Nelchina and Steese. However, the gains made so far in certain places for a few species are no cause for general complacency. For in Alaska, as in the States, modern machinery has enormously speeded up the conquest of the frontier. Changes, whether constructive or destructive, that extended over months or years in the old-fashioned days of small, slow, fishing boats, river transportation, hand shovels, and axes, sometimes are accomplished in an equal number of hours or days by today's bulldozers, airplanes, amphibious tractors, motorized floating canneries, and motor-driven chain saws.

This continually accelerating age of change allows less time than before for planning the best uses of Alaska's remaining biological wealth. If man is going to remain boss of his machines, thinking on conservation problems will have to keep up with the technological speed-up. The old frontier psychology based on a seemingly inexhaustible abundance will have to give way very soon to a modern awareness of growing scarcity, and there will have to be a similar speed-up in the many decisions and forms of action required to solve pressing problems as they arise. For situations not squarely faced and acted upon today may by tomorrow be carried permanently beyond hope of solution, if no over-all plan is devised.

VANISHING FRONTIER?

"Alaska is frequently referred to as America's last frontier, but whatever frontier there is remaining in Alaska appears to be rapidly vanishing under the impact of progress. Alaska is definitely forging ahead." This statement published by the House Subcommittee on Territories and Insular Affairs clearly reflects a current trend of thinking and action.

Certainly the economy of Alaska is expanding and changing rapidly. Its population has increased 74.6 per cent in the last decade, and construction of roads, business establishments, airfields, schools, hospitals, apartment houses, and single family residences is rapidly altering the face of most major communities.

But such changes do not prove that Alaska eventually must look like a smaller edition of some of the thickly settled parts in the continental United States, or that it should wish to do so. Surely, greater ultimate prosperity and happiness will come to Alaska's people through deliberately accepting and adjusting their way of life to their unique resources of climate, scenery, wildlife, and wild spaces. This is most likely to happen if they take pride in and consciously hold on to the best features of the frontier way of life for its own special values, rather than thinking of it as something to get rid of as rapidly as possible.

To be successful the future economy will have to use, without using up, all of Alaska's renewable resources, from seal skins to scenery, under a program which will perpetuate these resources indefinitely and retain more of the income at home. It is within the framework of this picture of the future — in which the frontier remains a living background — that leading persons in Alaska believe the infant tourist industry may outstrip all others in its potentiality. For it is a realistic assumption, borne out by visitor comments analyzed by the Alaska Recreation Survey, that vacationists primarily come to see Alaska's untamed frontier.

USE — WITHOUT USING UP

A basic step toward wise use of Alaska's wealth would be a general recognition that fish and wildlife, in conjunction with the scenery, is the Territory's greatest single economic asset, but not an inexhaustible one — of concern not only to the immediate harvesters of a particular kind of fish, fur, or timber crop, but to every Alaskan. When this realization prevails, the efforts of various agencies to protect Alaska's natural resources should receive much more appreciation and effective financial support than they get at present.

Similarly, it seems that the need for a more comprehensive and ade-

quately financed fire-control program for interior Alaska should be recognized as everybody's responsibility. For it is now clear that these wild fires destroy not only timber, but caribou food and hence the caribou themselves and, by eroding the scenery and the wildlife, undermine the future economic structure of the Territory.

Better recognition also is needed of the basic requirement of some of Alaska's wildlife species: a spacious, unaltered habitat. The caribou—classic symbol of the old frontier abundance—is the most prominent, though not the only, example. The only undiminished herds now roam over some 80,000 square miles of the Brooks Range, the Arctic Slope, and an immense adjacent area in adjoining Canada. If they are to survive in their present numbers, they will need every bit of their present range, for the Arctic produces a less abundant lichen crop than their former ranges in the south, and the indications are that even the Arctic range is being used nearly to maximum capacity.

Other species which need a spacious habitat remote from extensive development and an increasing human population are the musk ox, wolverine, and grizzly. Looking ahead 50 years, it is becoming clear that the only opportunity for maintaining a pure wilderness area large enough for the indefinite preservation of the caribou and other space-requiring animals, lies in northeast Arctic Alaska. An area of the Arctic Slope and the Brooks Range lying somewhere east of the Canning and Chandalar rivers and north of latitude 68° would be ideal for this purpose, especially if its management could be coordinated with that of a similar adjoining area on the Canadian side of the international boundary; for the caribou and associated wildlife wander back and forth freely between the two countries and are inescapably wards of both.

Such an area in Alaska, if managed and protected so as to keep its wildlife and frontier atmosphere intact, ultimately might become a major attraction for tourists and residents of Alaska, and thereby a prime source of sustained revenue for the North. In any event, and from the standpoint of science and of practical wildlife management alone, use of the northeast Arctic in the manner indicated would be amply justified, because such unmodified regions are vital to game management and to the science of ecology. They are indispensable as permanent "controls" which always will be needed for comparison with the remainder of the Territory where man is altering "the balance of nature" for industrial purposes. The opportunity for saving unaltered regions of adequate size for this essential function has been virtually lost in the United States and is rapidly disappearing even in Alaska (Leopold and Darling, p. 25). Unless recog-

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Wildlife and Alaska

Alaska's scenery is incomparable, a continent's highest, iciest, wildest. Yet it can seem almost cheerless and sterile, as Mount McKinley's massif is, even though softened by a foreground of grass and trees. Add wildlife to the scene and something happens—something very vital.

We don't have to add it. It is there. The great bears and fighting fish, the moose, sheep, and caribou still know the long northern days and nights, still have an unquestioned right to be in their wilderness world, to live and die there.

Man can change all this, but need not. He may do it by mistake if he does not consider what is there, and the meaning of it.

photographs by WARREN STEENBERGH, CHARLES J. OTT, AND HERB AND LOIS CRISLER
legends by LOWELL SUMNER



The Alaska red fox cannot hibernate, nor can he browse at leisure on nature's stationary bounty of grass and twigs. To survive, he must be quicker and smarter than the small animals on which he feeds. . . . More prolific than intelligent, the rabbit and rodent tribes support a small aristocracy of cunning predators. To elude these, the snowshoe hare turns white in winter and brown in summer.



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The long-tailed jaeger, cousin of the gulls, is a bold, hawk-like hunter. . . .Through the simple virtue of rapid multiplication, the red-backed mouse and his cousins, the lemmings and meadow mice, easily hold their own against the North's intelligentsia—fox, coyote, lynx, wolverine. . . . The horned owl, large as a rooster and with the claws of an eagle, is a courageous, mighty hunter. Game is not appreciably diminished by this owl when food and shelter are adequate; otherwise mortality is high—equally high from other causes if all the owls are removed.





The lynx needs extra big, heavily furred feet for long wanderings through the deep snow—and much patience in stalking for the winning of a meal of rabbit, mouse, or ptarmigan. . . . Soft-furred as a chinchilla, the dainty flying squirrel (shown here scolding) glides expertly with the help of a parachutelike membrane extending from wrist to ankle. Its nocturnal habits have freed it from attack by hawks and other daytime predators, but not from the horned owl.



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The coyote must live by wits and skill. In summer things go very well following the appearance of a vast new generation of mice, rabbits, ground squirrels, and other creatures young and dumb, but by winter the cream of the summer food crop has been skimmed off, and some competitors like the wolf are more powerful than he. His wonderful wild music gives the touch of perfection to a campfire evening. . . . An inquisitive beaver observes human behavior.





The willow ptarmigan turns snow white in winter to elude the fox, lynx, and other hard-pressed enemies. The spring molt brings to this ground-nesting bird a brown dress to blend with the tundra and the willow thickets. . . . The parka or ground squirrel is a principal food of the coyote, wolf, wolverine, and grizzly. For nine months of the year he hibernates safe in frozen ground, and his summer's rocky homesites also make hard digging. Although no strategist of escape, he is alert and quick; above all he is prolific. . . . Northern phalarope. The female is larger and brighter than the male and leaves the care of the eggs to her spouse.





In Alaska, caribou in primeval numbers now survive only in the remote Arctic, which is too wet to burn and has not yet been substantially invaded by man. Here the lichen crop, the wandering caribou hordes, and the wolves still maintain their original natural balance. Caribou often stand nose down on snowbanks in summer because the cold air deters the hordes of flies and mosquitoes.



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Although the wolf is the swiftest and most powerful of the northern hunters, he too must depend for survival upon sagacity and teamwork. All but the youngest caribous, if in health, can run faster; Dall sheep can elude him among the crags; moose can stand him off unless hampered by deep snow. The

myth that the wolf is an arch villain, dangerous even to man, slowly gives way to the modern concept that this animal is an important natural tool for controlling the numbers of game animals in remote northern regions: wolf numbers can be allowed to increase when the game animals increase, so

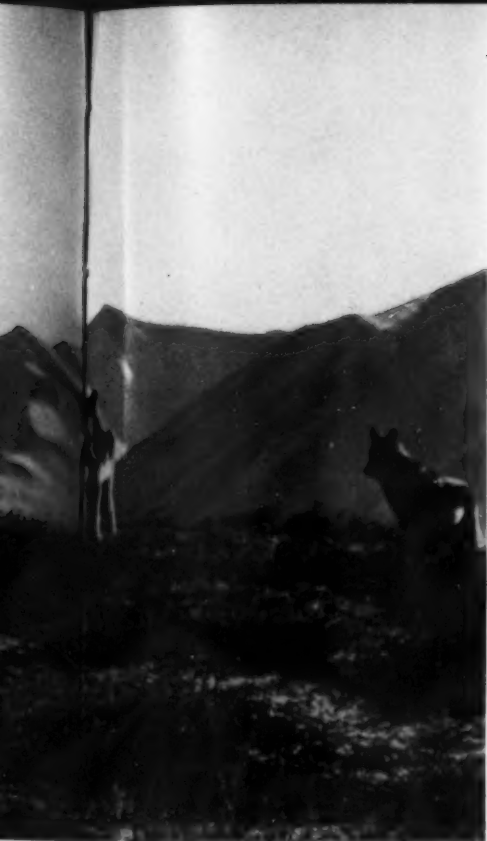
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The Wolf

photographs by

HERB AND LOIS CRISLER



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as to forestall destructive over-use of the natural range; should the game animals decrease, wolves then can be reduced in proportion. Significantly, the greatest abundance of wolves under natural conditions is precisely in those areas where game animals, especially caribou, also are most abundant

and flourishing. The home life of the wolf is zestful and solicitous. Mutual affection prevails among family members, and this strong doglike affection also is shown toward human beings if young animals are tamed at an early stage, something the Crislers greatly enjoyed doing.



Among their crags, Dall sheep are safe from nearly all enemies but man. Severe weather is more dangerous than other animals. Dall sheep survive in greatest numbers in Mount McKinley National Park and in the Brooks Range.





The Arctic weasel holds down the population of creatures too small or too elusive for the larger predators. His agility and elongated shape allow him to penetrate the winter retreats of mice and pikas, which during the long winter months are safe from most other enemies. . . . Little chief hare and rock rabbit are other names for the pika or cony, a little gray guinea-pig-like inhabitant of the rock slides. Even the powerful grizzly seldom can dig the rock rabbit from his limitless fortress of crevices and crannies. Hibernation also is unnecessary, for the pika stocks his underground rock chambers with a winter supply of herbs and grasses.





The wolverine's survival depends on extraordinary endurance against cold and fatigue, dogged perseverance, and enormous strength for an animal no bigger than a yearling black bear. He will camp near a carcass and gorge at intervals until even the hide and most of the bones have been eaten. Of a single wolf he probably has no fear, but against sudden attack by several he must be alert to have an escape crevice among rocks or down timber, or a tree to climb. This wolverine, temporarily a captive, was tamed into eating from the hands of Mr. and Mrs. Herb Crisler. . . . The porcupine's quills are not an absolute protection. The quick red fox sometimes flips him over and attacks the soft underparts. The wolverine, wolf and lynx occasionally get him, at the price of a face full of quills.

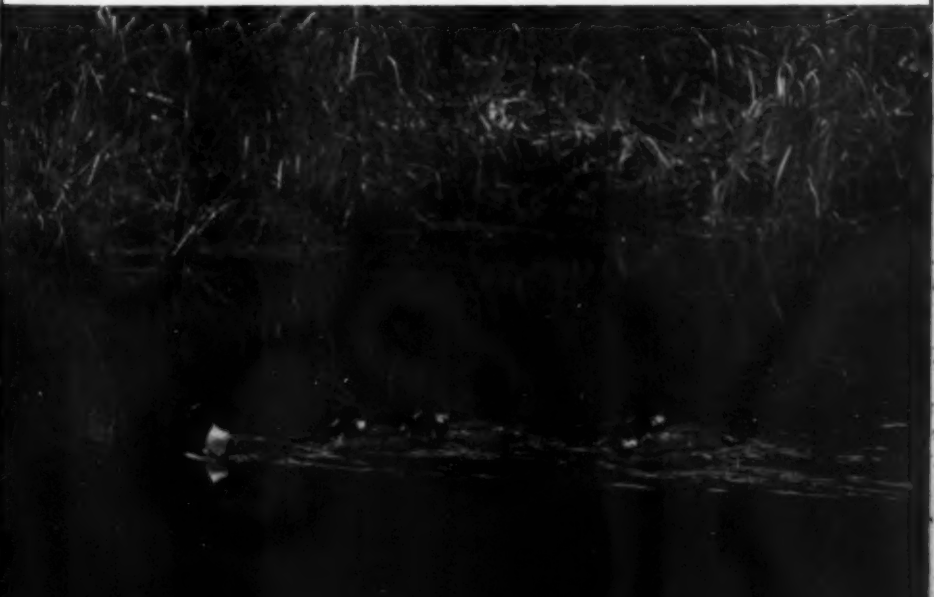


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The long summer days of the far North are a happy time of plenty and of zestful family life. Young red foxes frolic near their dens . . . and under mother's schooling young golden-eyes learn the rules for survival.





The grizzly's great strength and powerful claws are employed chiefly in digging. When he can find them, he digs up ground squirrels, marmots, and on rare occasions even young foxes. But his average daily fare is less ambitious—mice dug from their shallow burrows, berries in season, but especially roots and grass. In fact, the visitor's principal impression of the grizzly is likely to be of a peaceful plodding figure grazing on the tundra slopes like a cow or, as Alaskan's say, "like an old sow."



The snowshoe hare's brown summer coat matches his surroundings as well as the winter one. Disease epidemics reduce the populations every few years. Then their natural enemies, particularly the lynx, die off too, from malnutrition.

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The moose has benefited from fires, which have replaced spruce forest and lichens with the browse and thicket cover that this animal requires.



Marmots often push and wrestle in play, and the young climb on their mothers' backs. Their lives seem easier than most. For nine months, they sleep deep in the frozen, rocky ground while lynxes, wolves, and their relatives must prowls without rest, and often starve. And in summer it is easy for a marmot to fatten on new grasses, succulent leaves, flowers, and seeds. But even a marmot must be alert lest he be cut off from his rocky burrow by the crafty strategy of wolf, coyote, lynx, or fox, or by an eagle swooping low over the brow of the slope.





Photographs by Warren Steenbergh: McKinley, fox, jaeger, mouse, owl, lynx, flying squirrel, beaver, parka, phalarope, caribou on grass, young foxes, golden eyes, grizzly, moose, marmots, and the trail-weary bear.

Photographs by Charles J. Ott: Hare, coyote, ptarmigan, caribou on snow, Dall sheep, weasel, coney, porcupine, showshoe hare.

By Herb and Lois Crisler: The wolves and the wolverine.

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dition of this need and action come soon, preservation of such an area even in the supposedly remote Arctic is by no means assured.

The historian answers the cynic by pointing out that history can teach its lessons to those who wish to learn. Nor must we necessarily do all our learning from history's darker pages. On the bright side, the history of the outdoor recreation industry in the United States offers to Alaska an opportunity to profit still further from one of man's constructive achievements in land use. In its first years this United States industry was a struggling infant too, but it has grown to enormous proportions despite the fact that few states are as spectacularly endowed with scenery, fish, and wildlife as Alaska. In 1947, Newton B. Drury estimated that the people of the United States would soon spend six to eight billion dollars on the many activities included under the recreational use of wildlife alone. By 1953 the figure had reached approximately ten billion dollars (Stiles). In 1953, the Curtis Publishing Company's fourth nationwide survey (covering only the 48 states) indicated that U. S. residents (motivation by wildlife not considered; short weekend and one-day pleasure trips excluded) spent almost eight billion dollars on long vacation trips (three or more days away from home) in that year, plus another two billion for weekend trips.

Obviously, the comparative nearness of large centers of population has contributed to the tremendous growth of the outdoor recreation industry in the United States. But with the extension of the national transportation network to Alaska, vacationists are increasingly inclined to travel long distances. Their continually growing leisure time also induces them to go ever farther afield in search of scenic wild areas. Already in the United States the thought is being expressed with increasing frequency that, "In view of a rapidly expanding population in industrial states such as California, Texas, Michigan, and Ohio, it would seem that States with low populations and superb recreational facilities could enhance local, as well as national, welfare by devoting a larger share of their resources and efforts to recreational development, rather than to an expanding industrial program and ultimate depletion of their expendable natural resources" (Patterson).

Already in Alaska the tide of visitors from the south is clearly rising in spite of the generally inadequate accommodations which so far have prevailed. Even now the combined annual cash expenditure in Alaska of \$22,493,400 by resident and nonresident hunters, anglers, and other recreationists (lumping together here those tourists who are motivated by wildlife and those who are not) places recreation in third place among

industries derived from the Territory's natural resources, so that it is outranked only by commercial fishing and by mining. Or if one still prefers to combine *all* wildlife, including commercial fishing, one may go back to considering pure tourism, unmotivated by wildlife — if such a thing is possible — as taking *fourth* place, as we did at the beginning of this article.

I have endeavored to show how vital a stake in Alaska's fish and wildlife you may have as a visitor. Significantly, some Alaskans have stated that, without wildlife, the Territory's recreation potentialities probably could never attract enough people to become a major economic factor however scenically imposing the region might remain (Alaska Field Committee, pp. ii-26).

If you become a resident, the stakes are even higher. Many, probably most, permanent residents would not care to make Alaska their home if the fighting trout and the yearly salmon runs were gone except in old pictures, if the trails of bear and moose had faded from the river banks, if the bands of wandering caribou were only a legend handed down from a vanished frontier. These things color all of life in the North. They give to the inhabitants as well as to the growing tide of visitors a strong feeling of adventure, of independence, and of opportunity for a vigorous outdoor way of life that has gradually diminished in lands completely tamed.

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Reports and Correspondence

REVIEWING OUR NEEDS FOR SCENIC RESOURCES

By DAVID R. BROWER, Executive Director

IN THE COURSE of the year it has been my privilege to represent the Sierra Club at various meetings about the country (see page 84) and to stress the importance of the concept of the Scenic Resources Review described on pages 1-10 of this *Bulletin*. As far as I could tell, the reaction has been reassuringly favorable every time. The concept adapts itself well to just about every kind of conservation contest we have entered. Perhaps a condensation of part of the testimony I gave will serve two purposes: show in some detail what has been said about several subjects which concern the club—water development, forests, parks, wildlife, wilderness, roads—and clarify their relation to the Scenic Resources Review.

ON THE COLUMBIA BASIN

A typical presentation is the statement made at hearings held by the Army Corps of Engineers in Missoula and Spokane on July 9 and 10 concerning ways to revise earlier plans for control of the Columbia River and its tributaries—an international problem, and very complex. I said in part:

In behalf of the Sierra Club, I am appearing to request that the agencies charged with Columbia Basin water development, as well as other interested groups here, give most careful consideration to planning for the preservation of the Columbia Basin's scenic resources in the course of working out a program of water development. We hope that all groups may work together to assure that the needs of progress are met without sacrifice of unique qualities which are of great importance to the region and to the nation—qualities which cannot be put together again once they have been taken apart.

The Sierra Club is 64 years old. It consists of more than 10,500 members from all walks of life and all parts of the country, but most of them from California. The club has members who are prominent and many more who are not. They share one purpose: to explore, enjoy, and protect the natural scenic resources, including the wildlife resource, which make this land America the beautiful. We are conservationists, all interested in wise use, but especially interested in preserving from development those scarce and special places in our vanishing wilderness which dollars can never replace in kind and for which there will always be human need.

We are a small part of what you might call a national force that has been building to protect the special resource of parks, wilderness, and wildlife. That force is represented, in a way, by the Natural Resources Council of America, of which I am the present chairman. This is a forum of 37 national and regional conservation organizations having a total membership of 2 million. That force is further represented by the voice of the people themselves, who are realizing in increasing numbers that the few samples we have left of original America must not be sacrificed needlessly.

Witness that public force on the national scene as it was measured in this Congress. In the controversy over Dinosaur National Monument and the proposed Echo Park dam, the Colorado River Storage Project bill was doomed to a 70-90 vote defeat in the House of Representatives so long as Dinosaur was threatened. The threat was removed, whereupon the bill coasted through with a 120-vote majority.

The same force brought a 3-1 defeat at the polls last November in New York State to a proposal to invade part of the Adirondacks which New York citizens wanted to keep forever wild—strong wilderness support in spite of eminent opposition.

The same force showed itself recently at the city level in Eugene, Oregon, where the people chose at the polls not to sacrifice for a power project a beautiful stretch of wild stream, the McKenzie River headwaters. Similar forces are developing rapidly to protect the intangible values of the Rogue River.

All I am trying to say is that we are witnessing a change in the American temper—witnessing a mature realization, in the nick of time, that we must vigorously and dynamically support the preservation of our scenic resources and especially our living wilderness. This doesn't mean that we're building a breed of people who don't like man's handiwork; it's just that people are discovering that even the most civilized man needs places where he can appreciate what God's handiwork is like, unaided by man. People are recognizing that we cannot forever continue to multiply and subdue the earth without losing our standard of life and the natural beauty that must be part of it.

Policies applicable to the Basin

The Sierra Club believes that the flood-control and power-development needs in the Columbia Basin can be met without jeopardy to important scenic and wildlife resources. There should be optimum use of damsites which do not imperil these resources, no matter whether public or private agencies or a combination of both build on the acceptable sites. These sites should be developed fully enough to meet the overall flood-control requirements with a minimum number of structures. There should be proof that there is no alternative course of action before irrevocable damage is inflicted upon the important scenic and wildlife resources.

The club—and this is the general feeling in most other conservation organizations I know of—is in favor of sound water development. However, we consider it not in the public interest in the long run, and therefore oppose, any dam or reservoir proposal which would adversely affect a national park or monument or duly designated wilderness area.

Conservationists in general are feeling a growing concern about indirect peril to major scenic resources. For example, the Citizens' Committee on Natural Resources, Washington, D. C. have already voiced conservation opposition to what they are convinced is inadequate development in Hells Canyon. They are not concerned with the public vs. private power controversy. But they are concerned with the threat to major scenic and wildlife values arising from partial development in Hells Canyon. Nearly 3 million acre-feet of storage is seemingly about to be blocked there. This has already led the Corps of Engineers to seek replacement storage on the Clearwater River, where conservationists are opposing the proposed Bruce's Eddy and Penny Cliffs dams. Likewise, apparently, the Bureau of Reclamation is seeking further control of the Upper Snake River in the tremendously important scenic country above the Narrows, in Wyoming, and in Grand Teton National Park and the Teton Wilderness Area—an effort which conservationists must oppose.

Conservationist thinking on the Columbia

Let me summarize conservationist reasoning here, so that you may understand it even if agreement with it may not be unanimous:

1. It is clear, in the Columbia Basin, that there is not enough flood control now.
2. Remedial action can take four forms:
 - a) Flood insurance. This still requires more legislative pioneering; it will not save lives.
 - b) Evacuation of flood plain by zoning to prevent new construction or replacement of present structures. This is uphill work, literally and figuratively.
 - c) Upstream watershed management. Practiced with care, this is good conservation; but, it is not effective in controlling the big floods.
 - d) Flood-retarding structures—midbasin dams and lower basin channel improvement. This action has strong engineering and political backing. We are spending billions on it.
3. To protect scenic resources from flood-control action we must concern ourselves with the effects of dams.
4. The Corps and the Bureau agree that to skim the flood crest from the Columbia River, we need a Main Control Plan, and eventual flood-control storage of 20-30 million acre-feet can be presumed.
5. Scenic Resource needs should be integrated with this flood-control need.
6. Whenever storage is provided, someone's special interest will be damaged.
7. The first projects authorized should be those causing tangible damage which can be reimbursed with money, for example, at a cost in dollars, railroads and highways can be rerouted, power generation can be substituted for, and farm land can be replaced in kind.
8. The very last to be authorized should be those projects causing damage which no amount of money can replace. This would include damage to national parks and wilderness which man cannot duplicate.

As things stand, in the Columbia River Basin, we seem still to need to provide about 15 million more acre-feet of usable storage in the Main Control Plan. Conservation opposition has delayed about 2 million at Glacier View and will probably continue to delay it indefinitely. Partial development plans seem to have blocked 3 million at the John Day and Priest Rapids sites; partial plans are in the process of blocking nearly 3 million at Hells Canyon and may well be about to block 3.5 million at Buffalo Rapids No. 4 if a run-of-the-river plant is built instead of a major storage structure at Paradise; moreover, the smaller development will add greatly to the pressure for major upstream storage in Glacier National Park, either at Glacier View or at Smoky Range. Conservationists will be forced to oppose both of them.

Thus, to many conservationists, the solution would seem to be to assure full development at Paradise, Hells Canyon, Libby, and in the outlet-works improvement at Grand Coulee, saving the upper reaches of the Flathead in Glacier National Park, the Snake in and near Teton National Park, the Salmon and the Clearwater for scenic and wildlife resources, which in all probability will be in very short supply by the year 2,000.

Conclusion

The Columbia Basin is an especially good area in which to initiate a Scenic Resources Review—a comprehensive plan for adequately protecting now, with an eye to the long-range future, an optimum reservation of the basin's scenic resources of parks, wilderness, and wildlife and their tangible and intangible values for public use, enjoyment, and education.

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The plan would consist of a cooperative enquiry by many agencies to develop answers to five basic questions. . . . We believe that the best possible answers to these questions should be sought out before irrevocable decisions are made. Adequate answers are not now available. The nation has immediate need for a broad perspective such as detailed answers to these questions could provide. We believe such a long-range interagency study can be conducted within the framework of present law. Or it may need new legislation. We invite your comment and help.

ON THE CALIFORNIA WATER PLAN

If there is anything unique about water-development problems in the Columbia Basin, it is the abundance of water there. Scarcity of water, however, doesn't necessarily make it any easier to balance water development against scenic-resources preservation. The contest to prove that natural scenery and water development could coexist in the Upper Colorado Basin was a rugged contest, and very much worth it. California's future will probably see many similarly rugged contests as the California Water Plan, designed to move water from areas of abundance to areas of scarcity, begins to take shape. The relationship of this problem to the SRR is touched in an extract from remarks to the University of California's Fourth Annual Conference on City and Regional Planning at Richmond on May 11:

People are recognizing that we must give the most careful consideration to planning for wise use and preservation of our scenic resources—our parks, wilderness, wildlife, and the special recreation which they support. It is my hope that groups such as this one will vigorously seek, and my belief that they will find, the means to meet the needs of progress without sacrifice of unique qualities which are of great importance to a city, a region, to the state, and to the nation—and I'm referring to the precious samples of wildness that yet remain, whether in small patches or in large reservations.

The daily papers tell of the recurring threats to these values, and also of the uneasy stirrings of people who don't like what's happening.

Some of you probably saw Dr. Robert C. Miller's recent letter to the *San Francisco Chronicle*, "The LosAngelization of San Francisco," and have seen the *Chronicle* follow up editorially to question the blessings of freeways and to speak of the "tyranny of the automobile."

The same news columns suggest what in some respects might be considered the tyranny of water development. We have read of some of the details of the California water plan, a multibillion-dollar development to meet California's ultimate need for water.

That word "ultimate" should be looked at long and hard. So far as the water plan is concerned, I am not satisfied that we have a good definition of "ultimate." I don't want to delegate to engineers the working out of the definition, although I have the greatest respect for engineers as builders. Society is quite a bit more than engineering works, however; and I'd like to hear what the philosopher has to say about "ultimate"—or the demographer, or the physician or the psychiatrist or the theologian. I would like to help leave my children something besides what Wallace Stegner describes as "a world mass-produced, with interchangeable parts."

To water planners, the word "ultimate" means a state population of about forty million, and a Bay area population of from fourteen to seventeen million. If we continue to consider that growth is the chief element of progress, we're growing fast

enough to meet that ultimate terribly soon, and we are planning our engineering works, it would seem, to meet it before it gets here.

I leave it to you to picture the ultimate Bay area, with perhaps five to ten times the traffic, the noise, and the air pollution, and about one square foot of living space for every five or ten you have right now. If the ultimate Bay area prospect pleases you, then I would ask you to consider the *postultimate* which must surely follow—the aseptic world with a photomural on the wall of the oxygen tent to which your grandchildren must retreat for their synthetic outdoor experience.

I should like to make a rhetorical motion—to move that we eliminate the word “ultimate” from our planning, all our planning, and that we substitute therefor the word “optimum.” I think this would result in a very desirable change of emphasis. Not the *most*, but the *best*.

I don't see how we can expect to keep open spaces, scenic and recreational resources, or anything that gives our culture a valuable context, unless we resolve so to shift our emphasis.

For the specific example, let's look at a tiny part of the state water plan. I haven't seen a copy yet, but hope soon to wade through it. Already, however, I know that it contemplates two dams within Yosemite National Park—on the Tuolumne and on the South Fork of the Merced. Yosemite, as most of you know, is already badly overcrowded at times, and our population hasn't hit one-third of the “ultimate” yet, nor has our hoped-for amount of leisure time for travel to national parks. The Sierra Club's short film, “Two Yosemite,” which will be shown tonight, will present further remarks on this subject. But I just wanted to cite a simple example of what kind of problem we may expect to see multiplied in the complete water plan. More water for more people—at the expense of scenic resources. Not too much thought of the fact that man cannot live by bread alone, or by water alone, or that reservoirs permanently preempt key living space in a land.

In a state growing as rapidly as this one, we all face a special challenge that requires a careful review of our scenic resources. This will guide us, I think, toward a multiple use of our ever-more-crowded lands. But it won't put conflicting uses in the same place. To each its own place, and always a place for beauty.

California's scenic beauty is something very special. Much of it is still unspoiled. It is an important part of what man needs in life besides bread, that man will need still more than he does now, that he will choose to keep if we leave him that choice. Posterity has no vote except in us. Its people must live with what we decide upon now.

To quote Weldon Heald, “God Bless America — Let's Save some of it!”

ON REGIONAL PARKS

Last September the San Francisco Chronicle spoke of the tyranny of the automobile once again, when it editorially lamented “the inertia of bad planning” which “will in time deposit on the Embarcadero a permanent blight”—a double-decked freeway “cutting off the Ferry Building and blighting downtown San Francisco.” The editorial concluded:

“The blight in turn will take an intangible toll from the city through the destruction of esthetic values. The double-decker freeway will be a living monument to the tyranny of the automobile, a tyranny which has made too many captives to the view that whatever helps move automobiles at the least cost, and hang all considerations of beauty, is right.

"There is a massive problem here for American cities. They need, San Francisco needs, leaders who will recognize it and stand fast to save beauty from the beast."

The nation's exemplar, Washington, needs them too, to save beauty from the tyranny of pavement. This was the issue before the Senate Committee on Interior and Insular Affairs in February 1955 when I made this statement to the Committee in behalf of the Sierra Club and the Federation of Western Outdoor Clubs:

These organizations believe in parks for today and for the future; they know that the only way we shall have the park areas we shall need for our expanding population is to require ourselves to exercise self-restraint in developing this land.

The main conservation concerns of the groups for which I speak are the national system of parks, wilderness, and refuges. We consider Rock Creek Park to be part of the national park system in fact as well as in name, part of one of the most beautiful cities of all. When something happens to Rock Creek Park, the bell tolls for all of us, for we are all involved—it is happening to our park, the Nation's park; and it is setting the pattern for parks all over the land, whether they are National, State, regional, or city parks.

Thus, I, a westerner, am concerned about what the present proposals to impair Rock Creek Park will do directly along Rock Creek, and I am also concerned about the effects of action in Washington upon Central Park in New York, Golden Gate Park in San Francisco, and Tilden Regional Park, across the bay from San Francisco, where I hope my children will be enjoying a sunny Saturday a few hours from now.

We have great faith in engineers when it comes to engineering, and we believe that engineers can bring about any solution to Washington's traffic problems that Congress requires the engineers to bring about. If Congress, mindful of the irreplaceable values that transcend the engineer's columns of figures, requires the engineers to assume that Rock Creek Park does not exist for transportation purposes, then those engineers are certainly capable of coming up with a feasible solution to transportation needs—whether it be alternate routes, by-passes, a peripheral parking plan, or a reversal of the trend away from mass transportation that has perplexed every traffic engineer in the business. If they should not be capable of coming up with a solution, then we should do well to wait for other engineers who can, for we cannot undo the damage to something unique which would otherwise be destroyed.

Holding fast to a park principle has built an enviable system of national parks for this country. It has also kept Central Park from being subdivided and skyscrapered and has kept it an asset for all New York. Holding fast has kept Golden Gate Park from being covered with row upon row of mimeographed houses that could so easily have blotted out John McLaren's dream. Holding fast will keep Rock Creek Park as a sanctuary for people living in a district where life is so hectic they need such a sanctuary; it will also retain for the National Capital an extremely important and renowned part of its beauty in the eyes of the Nation and the world.

We hope you will act favorably on Senate Joint Resolution 36, and suggest that editorial attention be given to the provisions pertaining to relocation and realignment lest some enterprising engineer find a loophole in the wording through which he might try to drive a truck.

Perhaps Washington's traffic problems will never be solved; but let us be sure while we go through the headaches of trying to solve them that there is a quiet natural beautiful place always there for us along Rock Creek.

This was all that I had intended to say, but a few further thoughts occurred to me during yesterday's testimony. Opponents of the resolution seemed to be of two or three minds on the question of highway versus park; the highway was in keeping with park values and concepts in one part of the park, but not in another, and it would be a good idea, perhaps, to have an expressway all the way through the park—these were the opponents' conflicting views. They seem to underline the need for Congress to make it clear that parks are for park use, and not for highways leading heavy traffic somewhere else.

It was disturbing to see a firm of landscape architects in the position of advocating that an expressway was good because it enabled more people to see a park. If we accept that thesis, parks are doomed everywhere—and we must finally conclude that the more the lanes of traffic and the faster the speed, the greater the use of parks. I hope this committee will agree that a park has far more to offer than what can be seen in a frantic minute or two through a windshield—even a panoramic windshield. Rock Creek Park is already accessible to those who can only drive through it—it has winding, charming roads built with the park as an end in view, not for a fleeting glimpse on the hurried way to some place else.

It is already unfortunate that the upper meanders of the park are so narrow. Let us show that they will not be made still narrower by pavement that destroys the surface and traffic that destroys the mood. In a way a park is a doughnut, and the place a man stands when he uses it is the hole. Take away the setting, invade the mood, and that hole becomes part of nothing instead of the center of the park. It is a little like this room. We use the floor and the first 6 feet of space above it; but it takes the rest of the space, and the walls and the ceiling and the decor, to make this a room that has meaning. So it is with parks. By and large it is the part that you do not use for everyday purposes that makes it a park. A park does for you what a park is meant to do when it changes your pace and mood—when you spend a good chunk of the day in it and become part of it for a while; not when, because of a traffic light or a traffic jam, you screech to a stop, then roll down the window for a quick sniff of the great outdoors before the man behind blows his horn.

Because our planners of the past used good vision, a place of Rock Creek's beauty has survived well into the automobile age, of which Bernard De Voto recently wrote, "American culture has made travel by automobile the most satisfactory way and is proceeding to make it impossible." East of the Mississippi and north of Kentucky, he says, "the future has arrived, our mechanical and engineering genius has undone us, and all the institutions of the automobile age are approaching paralysis. For make no mistake about it, the throughways and toll roads are putting an end to what the ads call happy motoring. The density of the traffic and the speed at which it moves destroy the comfort and ease of mind that have hitherto commended auto travel." Mr. De Voto has one more reference to the automobile in his recent Harper's piece on public relations artists versus the traveler; he speaks of the time—the imminent time—"when the superhighways have made automobile traffic obsolete."

Rock Creek Park has pretty well survived the automobile so far. We hope that neither the State of Maryland, which controls so much of the National Capital's metropolitan area, nor the Congress, will permit the sacrifice of so much in irreplaceable park value in order to gain so little—if anything—in the moving of vehicles. For here, where the Nation's pulse pounds hard, there are no more havens for all the people where Rock Creek Park came from.

ON ROADS PROPOSED FOR WILDERNESS

The current tendency to think twice about what freeways or throughways may be doing to us, as well as for us, was preceded nearly 25 years by a marked change in our thinking about the relation of roads to wild places. I was sent to Fresno to speak on this subject on April 20 before the San Joaquin Valley County Supervisors Association, with particular reference to a proposal to construct a new trans-Sierra highway just south of Yosemite National Park. Excerpts follow:

John Muir, our first president, strongly supported the bringing of automobiles to Yosemite Valley. Too few people knew about the mountains and the parks. If they didn't find out, there would be no force to protect them from destructive exploitation. In its early years, the Sierra Club felt that many new trans-Sierra roads were needed.

In the early thirties that trend of thinking slowed down markedly. That was about the time the first Primitive Areas were set aside in the National Forests. By 1936 the thinking reversed. People realized that an ever-increasing number of automobiles was not a total blessing. They became concerned with Yosemite's fatal beauty—the attraction that was beginning to bring so many people to Yosemite as to jeopardize and destroy its charm.

Nor was it just the hiking clubs who were concerned. In 1936 one of California's most illustrious forums, the Commonwealth Club, completed a full year's study of the question of mountain roads. The following resolution was put to a vote of the entire club membership:

We believe that California's undeveloped high mountain areas have been reduced dangerously near to a minimum for the welfare of the State, and that no further intrusions by the building of roads should be allowed without convincing proof of public necessity.

After reading the comprehensive arguments pro and con which the Commonwealth Club published June 2, 1936, the membership voted the resolution by an overwhelming 650 to 70—better than 9 to 1. Not so-called "nature-lovers," these men, but many of California's most eminent and successful businessmen and leaders.

That was 20 years ago. Today we can be thankful, I believe, that these men took that stand. For despite it, and despite the best conservation efforts since then, our wilderness has shrunk still further, and the number of people who need it has increased far beyond expectations.

Nine years ago the Sierra Club took its present stand. In effect, we support the preservation of the unique wilderness of the High Sierra, whether it was protected by law in the National Parks, by regulation on the National Forests, or merely by the fact that it is not developed. From Tioga Pass on the north to Walker Pass on the south, stretching along the backbone of the state, is the finest, longest wilderness in the country. There are no more where it came from. People come in increasing numbers from all over the nation to see it and travel in it as wilderness. If we keep it there, millions will see and enjoy it that way through the ages—that is, millions, a few at a time. And other millions, whether they have a chance to see it or not, will have a special pleasure in knowing that it is there, for someone, some time.

If future men decide that this is a luxury they can no longer afford, they can choose to change it. In a few months they can, even with engineering skill no more advanced than ours, undo what nature has taken aeons to build and what man can never restore. They could do this, that is, if they chose to. I hope they don't. The

Sierra Club's stand would merely make sure that these men of the future had the chance to choose. We ask that no trans-Sierra roads be built between Tioga and Walker passes. We resolved this in 1947. We think that planners, and the engineers who build what planners plan, are ingenious enough to spare this place, the finest wilderness in the land.

In other words, we feel that if this stretch of the Sierra were somehow actually impassable, it would not be necessary to abandon the San Joaquin Valley. Life, development, and progress could go on here. Ways would be found to get the food and fiber for progress around this barrier, or to fly them over it. These alternatives might take a little more time, and cost a little more money. But they would spare what neither time nor money can replace.

Therefore we ask you to base your action on this assumption—the great Sierra wilderness is a barrier against which man, by his own choice, refuses to pit his engineering skill. By his own arbitrary rules of zoning, he will keep his bulldozers, his dynamite, his combustion engines, his wheels—all these he will keep out. All he will pit against this primitive barrier is his own primitive skill, in using his own two feet, or in persuading his pack animals to use four feet.

If you make this choice, if all of us do, we can be assured of special benefits for all time to come. Generation after generation can find recreation and inspiration there. The watershed, so important to you, will be maintained in all its natural protection. Untouched natural processes will continue for man to observe scientifically and to compare with the land he has improved (to see from time to time how he's doing). Wildlife can prosper in this place as it always has. And it will constitute an unmolested reserve, should man ever have to exploit the few commercial resources remaining in this small sample of what America once was.

All this has been fairly general, but I think this general approach is important to our planning of what kind of California we want to have in a more crowded future.

I think I have most of the arguments for a new Mammoth Pass highway in mind—the new recreation area that would be opened up, the access to Mammoth Mountain winter sports, the Hawthorne ammunition route, the escape route in case of disaster, and so on. I think we have good answers for these arguments, and will try to point them out if you wish. We think the answers are compelling.

We hope to persuade you of this: if this road goes in, it is there for keeps, and our finest wilderness is gone for keeps. The people in favor of roads can lose arguments again and again. The people trying to save a superlative bit of wilderness can lose only once. We hope that you will help save this wilderness.

So far as the problems of transportation are concerned, we hope this group will urge a comprehensive study of San Joaquin Valley needs and their relation to the state as a whole. The Division of Highways and the Department of Defense should be brought into the study. They and you should consider how to get maximum effectiveness from the routes already developed—Sonora, Tioga, Walker, and Te-hachapi passes and their relation to the chief northerly routes over Donner and Echo summits. The study would need to consider present traffic patterns and the trends that indicate what the future will bring.

I would hope, above all, that the national conservation interest could be represented well in this study. The High Sierra wilderness happens to be in your backyard, and I think in mine too. But it is also the only place of its kind in the nation, one of the most livable, enjoyable places for primitive wilderness travel in all the world.

In a state growing as rapidly as this one, we all face a special challenge that requires a careful review of our scenic resources which can lead to decisions that won't jeopardize very real future needs. . . .

The Sierra Crest country between Tioga and Walker is something very special. Most of it is still unspoiled. As it is, we say, please let it be.

ON LOGGING AND VIRGIN FORESTS

The Scenic Resources Review derives its name, if not its inception, from the Timber Resource Review—the "TRR" you hear about whenever the future of timber production is discussed. The TRR is a recurring study, the latest edition of which was placed before the public in abstract form this year in a Forest Service booklet entitled "People and Timber." Shortly after its precursor appeared—the six pounds of charts, diagrams, and text which constituted the draft edition—the Sierra Club wrote Secretary of Agriculture Benson urging that the Forest Service give equal consideration to the other multiple uses of National Forest lands, including recreational and wilderness use and watershed protection. There was a growing apprehension in conservationist circles that the Forest Service might become too enamoured of timber production, at the expense of other forest functions, if this were not done.

This apprehension was expressed in the first part of my letter of September 13 to Dr. Richard E. McArdle, Chief of the U. S. Forest Service, about a controversial timber sale in Sequoia National Forest:

One of our primary interests is in comprehensive planning, as opposed to piecemeal planning, for the use of our natural resources. This was expressed in our proposal to Secretary Benson that a multiple-resource review be undertaken to supplement the Timber Resource Review to help place the latter in good perspective. We have developed our proposal further as an interagency. Scenic Resources Review, and this is receiving increasingly wider support. We know that you and the Secretary appreciate the importance of this approach, and we in turn appreciate Dean Samuel T. Dana's insight and skill in seeking, at the request of the Forest Service, a program of research that will become an important part of the broad review the country needs.

There have been some recent controversies between your organization and ours—and others like ours—growing out of competing and often incompatible demands for the same piece of forest. It is pertinent to point out, however, that these differences are the exception, not the rule; that vexing though they may sometimes be, they are probably good for us; and that they all too often obscure the general agreement and unanimity of purpose we share. For example, the production of timber in the postwar period has almost trebled in California; this has required excellent resource management, and the Forest Service has come through notably. In all this, as an off-the-cuff estimate, conservationists have had no occasion to take exception to 99 out of every 100 board feet that have been produced.

There remains that small part of the total where we have conflict, a part that can be relatively very important to meeting the future's need for scenic resources. Here any precipitate action has a potential of doing irrevocable damage to irreplaceable natural values. And so much for the preamble.

Regarding the proposed Salmon Creek sale, we cannot understand the rapidity of events which threaten to set the course for the Cannell Meadows working circle and the southern Sierra area of which this is an important part. Here are the considerations as we see them:

1. Some type of wilderness preservation has been proposed for part of the area in question. Expression of national interest has not been sought yet.
2. A detailed administrative plan that will preserve the primary recreation and wildlife values — for developed, as opposed to wilderness recreation — is needed for another part. To the best of our knowledge, this does not exist.
3. Timber production for commodity purposes may well be essential for still another part. This has not been proved.
4. Watershed protection is needed for all the area.
5. Other conflicts for key areas are in prospect.
6. Local groups have not had adequate time for study.
7. National groups do not have the beginning of the necessary information for developing their opinions of the national interest.

The feeling of apprehension was amplified in a commentary addressed to cooperating organizations, which said in part:

Looking to the year 2000 in its booklet, "People and Timber" (June, 1956), the Forest Service concludes, "If we put every acre under good forest management we can have the timber we need, for timber is renewable." The same booklet points out also that each of us uses twice as much lumber as a Russian, six times as much as a Frenchman, and far more paper than anybody. The booklet's very last statement is: "The real key to our future timber supply lies in the hands of those *one out of every ten American families* who own our small forests . . ."

There's a good question to ask. How about *after* the year 2000? . . .

It is the year 2001, let's assume. Every acre is now devoted to good management for timber. But the demand keeps right on rising to use six times as much as a Frenchman (or maybe seven times by then); so we are faced with a shortage of timber. We have already subordinated other forest uses — recreation, wildlife, wilderness, watershed protection — to timber production; we have gone right up to the top, cropping the formerly unmerchantable forests near timberline. We are using more than we can grow, renewable though the timber has been. Now we must resort to substitutes — just as they did after they had finally moved the Cedars of Lebanon out to the sea as ships; just as they did when the forests of Southern Italy had gone.

Our children, now in their productive years, are lamenting their forbears' failure to plan better. Why, they ask, didn't we figure back in the 'fifties on giving equal treatment to the other forest uses? Why didn't we plan things so that some of our recreation would be in natural surroundings, some of our wildlife in a natural habitat, with clear streams from naturally protected watersheds. Why didn't we make the word 'wilderness' mean something—and preserve for them a chance to know, somewhere except on the crags and glaciers, what the natural, God-made world was like? . . .

It's a safe bet that future citizens will need to develop some substitutes for wood products, and that they'll be able to, by the year 2000. It's also a safe bet that they'll be just as able to do so in the year 1990. If speeding up, by a single decade, their search for substitutes means that they will still have good recreation, wildlife, wilderness, and watersheds, who will be the poorer? The decisions that will give the future this choice, or obliterate it, are being made now. Sequoia National Forest is the scene of one of those decisions. Others are coming up — on the Three Sisters in Oregon, around Glacier Peak in Washington, in the Flat Tops in Colorado, in the Gila in New Mexico, to begin to call the list of imminent Forest Service actions.

A little known California area which could have an important future as a scenic resource may have a vital role in setting the pattern of decision. It's your forest and "only you can prevent" a wrong decision — you and the millions of others who will share your concern if they learn of it in time.

ON MOUNT RAINIER AND MISSION 66

The need for a Scenic Resources Review was underlined in the course of the recent controversy on Mount Rainier, where the National Park Service has been developing one set of plans for protecting the park in its coming period of heavier use and the concessioner has felt that a different set of plans would be necessary to allow the public to be adequately served. A hearing resulted from the conflict, and was held in Tacoma on October 15 by the Senate Committee on Interior and Insular Affairs. The summary of the Sierra Club's position stressed these points:

1) Paradise and Sunrise are the key vantage-point areas from which almost all the visitors to Mount Rainier National Park will obtain their maximum enjoyment of the scenic grandeur of the park—not only of the great mountain itself, but also of the immediate setting and its fragile charm of forested and open slopes. These areas belong to all the people and are priceless. They are some of the most valuable real estate existing anywhere. Their pricelessness should not be sacrificed.

2) These areas deserve the best possible protection consistent with necessary access. There is evidence that they are now being used too heavily to be able to recover naturally the charm they must retain if this generation is to fulfill its obligation to the next, as the National Park Act requires it to do.

3) Impact upon these areas should therefore be curtailed by any reasonable means to accord with their carrying capacity.

4) Structures to accommodate the inevitable increase in travel should be placed elsewhere than in the key vantage-point areas, preferably in places where the structures can (a) provide good vistas, (b) enjoy safe year-round use, and (c) be controlled by the National Park Service with respect to their architecture, surroundings, and use.

5) Structures should not be permitted in key vantage-point areas, or allowed to continue in them, which provide one person a disproportionate share of enjoyment of the place at the expense of precluding another person's enjoying it well or at all.

6) We believe that the following are important considerations:

a) A use should not be excluded merely because everyone cannot enjoy it.

b) Considering that space is limited at Paradise and Sunrise, priority should be given to a visitor center, which is available to all, rather than to a lodge, which is available chiefly to its guests, or a campground chiefly for campers.

c) Parking areas should not preempt for cars the scenic level space that should be available to people who want to get on the land.

d) While the uses listed above may seem conflicting, careful land-use planning may be able to provide for them in different places without impairment other than that consistent with balanced access-area development. A hotel need not be on level, campable ground, but should have a view and can be screened. A visitor center does not require a view or level ground. A campground requires fairly gentle slope, but does not need a view. Parking areas can be situated and landscaped so as to avoid harming the particularly valuable foreground scenery. Roads need not preclude the trails—the primary means of bringing people into close contact with the park.

7) We are confident that the increase in tourist travel to the state of Washington

is likely to be substantial and continuing, and that hotel accommodations at Paradise can be continued or eliminated without appreciably affecting the increase in the state's tourist revenue, *provided that* the state and the nation carefully protect the scenic gems which attract visitors to the state. Whether a superb vista is at a hotel's doorstep or a few minutes' drive away is of minor importance to the nation here. The superb vista is of primary importance, as is the mood of the place from which a man sees it.

8) The National Park Service has the special skills necessary for administering these requirements and should keep the public informed of its intentions and its reasons.

We have drawn our conclusions from our organization's 64-years' experience with national-park preservation. We think the conclusions are reasonable. We understand that Mission 66 is working toward these ends, toward solving the difficult problem of preserving and enjoying at the same time. We intend to support, to the best of our ability, the Mission 66 plans that seek those ends. We are confident, Mr. Chairman, that you understand this feeling, and that the Committee on Interior and Insular Affairs shares your understanding, as does the Congress. For the Congress has just reaffirmed its belief, after the great controversy over Dinosaur National Monument, that the National Park System is here to stay, just as the Congress sought to make clear when it created the system in 1916. In the eyes of the world our enduring National Park System is one of America's great achievements. We can produce, we can develop, we can expand our commerce, with all its benefits. We can also show restraint, just as all of us have done and now do when we say —

This is and shall be a primeval national park;
Here man will not second-guess the Great Architect.

In addition to the statements excerpted here, the Scenic Resources Review was stressed this year in these talks and discussions: at the Conference on Northwest Wilderness, Portland; at the Convention of the Federation of Western Outdoor Clubs, Spokane; at the Annual Meeting of the Natural Resources Council of America in Gatlinburg; before the Senate and House committees on Merchant Marine and Fisheries; before the Channel City Club, Santa Barbara; at the Federal Timber Hearings conducted by a joint Senate-House Committee, Redding, California; and in discussions with Secretary of the Interior Fred A. Seaton, the Director of the National Park Service, the Chief of the Forest Service, with representatives of Resources for the Future, and at the instance of the White House with the Bureau of the Budget. Many organization have resolved in favor of the study; The Wilderness Society asked that it be put in a form to be advocated, and the Izaak Walton League of America is taking the initiative in putting the concept in this form.

WE CAN HAVE SUGAR PINE — WITHOUT FIRE

Editor:

In the October, 1955, issue of the *Sierra Club Bulletin* appeared a most thought-provoking article, "Do We Want Sugar Pine?" In essence it proposed, after presenting certain facts and ideas, that if we wish to preserve sugar pine we must employ fire or some comparably vigorous expenditure of properly directed energy.

The fact is not disputed that in earlier times fires frequently ran uncontrolled through the coniferous forests of the Sierra Nevada. Neither does a doubt exist that

sugar pine somehow survived the fires. However, additional facts are available that may considerably modify the conclusion that to preserve sugar pine we need fire.

In prehistoric times, as now, nature provided for regeneration of sugar pine at a very leisurely pace. The tree is exceptionally long-lived and remarkably free of parasites in comparison with associated trees. Once in several hundred years was often enough for a future patriarch sugar pine to come into being, to replace its parent. In other words, survival of the species depended primarily upon the long lives of the individuals, rather than upon prolific regeneration.

Sugar pines typically never comprised a large part of the stems in a forest. Old growth contains five or ten sugar pines per acre. They were significant as a component of the forest because of their stately grandeur, the immense size of the individual trees, their dominant crown position, and their relatively high economic value. The Society of American Foresters (Committee on Forest Types) does not even list a sugar-pine type, that is, a forest-cover type in which this species comprises more than half of the board-foot volume or number of stems. Instead, it lists eight mixed-species types in which sugar pine is simply one of several components. On a per-acre basis, I believe that on the average, if one eventually dominant seedling became established every 25 or 50 years, it would suffice to maintain the natural proportion of sugar pine in the forest.

If an average of only one successful start per acre is needed every 25 or 50 years, and even if a rather high safety factor for premature mortality is allowed, no stretching of the imagination is required to see how the species was perpetuated before the introduction of large-scale logging. Natural reproduction required a good seed crop, low populations of seed-eating insects, birds, and rodents, favorable weather for seedling establishment, and an occasional opening created by windfalls, insects, or other natural forces. If these conditions coincided only once in a century, enough reproduction of sugar pine probably would result to supply the modest needs for replacement.

I do not believe that a material change has occurred in the rate of replacement of sugar pine except where seed sources have been virtually eliminated by logging. Fowells and Schubert made a detailed study of natural restocking of cutover pine-fir stands where pine seed trees averaged about one per acre.¹ During periods which averaged about 20 years, more than 10,000 seedlings per acre appeared, of which only 3 per cent were pine (sugar and ponderosa). At the end of the 20-year period, 3,680 trees remained — 5 per cent pines and the remainder white fir and incense cedar. Superficially, such stands would appear to have been converted to nearly pure fir and incense cedar. However, on 10 per cent of all the mil-acre quadrats that contained one or more trees, the tallest tree was a sugar pine! Thus, even a meager percentage of sugar pine seedlings from a rather scanty seed source will ultimately dominate a substantial part of the forest. Ten per cent dominance in the seedling stage can easily develop into 20 or 30 or 40 per cent of the final dominant overstory because sugar pines tend to live longer and grow faster and bigger than other species.

Timber harvesting has introduced a factor that was not part of the natural successional process. Logging, especially the earlier cut-out-and-get-out style, almost eliminated sugar pine in many places because it often destroyed seed sources and left only the less desired species to restock the land. Not infrequently, slashing fires swept

¹ Fowells, H. A. and G. H. Schubert. 1951. "Natural Reproduction in Certain Cutover Pine-Fir Stands of California," *Journal of Forestry* 49: 192-196.

uncontrolled across the cutovers, not once but several times. Sugar pine, especially in the smaller sizes, is easily killed by fire. The natural balance has been upset over extensive acreages at the expense of this choice species. In some places, the cutovers have been occupied by shrubs and other low vegetation, and in some places by other tree species. But more fire will not bring back the sugar pine unless it is accompanied by costly artificial regeneration measures—such as planting.

I think some misconceptions have arisen about the regeneration difficulties of sugar pine because of the special objectives of forest managers. Many timber owners and foresters want a high percentage of sugar pine among the crop trees. They expect to harvest crops in the future at comparatively young ages—say 100 years. They want to regenerate the forests immediately following harvestings. The effects are to raise the requirements for numbers of seedlings by at least ten times; to increase the frequency of crop rotations by about five times; and to speed up regeneration on the bared ground ten times or more. The result, $10 \times 5 \times 10 = 500$, means that difficulties compared to nature's way have been greatly enlarged. But this is a problem of technical forestry for timber production—not a matter of the threatened extinction of a species.

Today, a new change has occurred in the timber market that indirectly will help in the regeneration of sugar pine after logging. Markets and prices for the formerly less-desired associates have greatly improved. Consequently, the tendency to leave other species to reseed at the expense of sugar pine is diminishing.

My conclusion is that the need for fire in order to preserve sugar pine has been overrated. On the other hand, good reasons exist for recreationists, naturalists, and ecologists to be concerned about the future of sugar pine on extensive areas within its natural range. The species has been virtually eliminated on large acreages which were converted to brushfields by earlier logging and uncontrolled, repeated fires. Here, it can be restored only by artificial reforestation unless an almost intolerable delay is accepted. Tree-planting programs need public support. More serious still, sugar pine is now threatened by an introduced disease, white pine blister rust. This Asiatic disease first entered California in 1930, and sugar pine has poor natural defenses against the rust. Parks and other recreational areas are no more immune to blister than lands where timber production is the goal of management. White pine blister rust can be controlled, but it costs much money. All lovers of the out-of-doors and admirers of sugar pine, the monarch of the Sierra Nevada forests, should actively encourage blister-rust control and research. These are much solidier methods of assisting in the maintenance of sugar pine than any presently known method of prescribed burning in our mixed conifer forests where burning is, at best, a risky and uncertain procedure.

RUSSELL K. LeBARRON
California Forest and Range Experiment Station

REPLY BY PROFESSOR MASON

17 May 1956

Editor:

Among the many possible objectives in forest and national-park management there are two that are significant to the subjects of my paper, "Do We Want Sugar Pine?" and LeBarron's letter, "We Can Have Sugar Pine — Without Fire." We can manage

the forest or park for a given timber value or a given original natural condition, or we can manage for protection and take what comes when it comes. Either of these is a legitimate objective should it result from our considered judgment and accepted policy. From the title of my paper it is clear that I was discussing the former objective while (although it is not evident in his title) LeBarron is discussing the second objective. The only common ground between the two papers is the fact of the regeneration of sugar pine under the conditions provided by either proposed objective. It is not a matter of how many seeds there are, what percentage of sugar pine makes up mature forest population, nor of controlling white pine blister rust, although these subjects concern significant facts of great interest and importance to successful management under either objective.

What LeBarron fails to discuss is the primitive notion of ecology from which all other facts are generated, namely, natural selection. He does, however, give an incomplete discussion of survival, which is an integral part of continued sanction by the environment in the process of natural selection. Natural selection is precisely the relation of the organism to its environment, and hence it is the ecology of the organism. I believe Mr. LeBarron is aware of the basic fact in the ecology of most pines that the first two steps of natural selection, namely, germination and establishment, are most effectively accomplished on what may be spoken of as primitive soils. A primitive soil as I employ this term is one with a very low organic content such as one gets after fire or on slides. I maintain that if we are *managing* for sugar pine we would do well to see to it that these conditions are provided for its regeneration.

Mr. LeBarron is also aware of the fact that every organism contributes to changes in its own environment. One aspect of this is the addition of organic materials to the soils. This is one of the basic facts contributing to the phenomenon of plant succession. My point with respect to this is that with permission (through protection) of the survival of large numbers of other trees and shrubs this change is rapidly accelerated. Mr. LeBarron's point of the adequacy of minimal survival of sugar pine seedlings would be infinitely less probable if for no other reason than that seedlings could not become established. The environment is thus rendered beyond their genetically controlled physiological capacity. No doubt an occasional sugar pine would survive as a botanical curiosity and to this extent LeBarron has a point.

I gather from the tone of LeBarron's paper that any use of fire in California forests would amount to a willful abandonment of the forest to wildfire. Certainly this should, and could, be avoided.

The days of ecological self-direction of forests are over in any region of the world where there is any urgency, of any type, in their management. If the urgency is timber production we would do well to select what we want and manage toward it. We cannot afford to wait for natural ecological regeneration. If the urgency is fire protection then human stand-by crews are not enough. Some means of minimizing the threat of fire is imperative. The cheapest method is *controlled* burning.

HERBERT L. MASON
Professor of Botany
University of California

Mountaineering Notes

Edited by Hervey Voge and Ruth D. Mendenhall

SIERRA CLUB mountaineers ranged far and wide in 1955, as has been usual in recent years. Climbing done on some of the private trips is outlined in the notes that follow. In addition, there was a goodly amount of climbing from high trips and base camps. From the Teton high trip, ascents were made of Mount Bannon, Buck Mountain, South Teton, and Grand Teton. Other ascents were made in Glacier National Park. A large group from the Rainier base camp climbed Mount Hood. In the northern Sierra new routes were made in the Sawtooth region, and considerable climbing was done in the Minarets. In the southern Sierra, Mount Williamson, Mount Tyndall, Mount Barnard, Mount Ericsson, and Milestone Mountain were climbed. Members from the knapsack trip up the Franklin Glacier climbed Mount Vigilant in the British Columbia Coast Range.

CLIMBING IN THE NEW ZEALAND ALPS

IN JANUARY, 1956, several climbs were made in the New Zealand Alps where I stopped off en route to the Himalaya. Companions were Peter Robinson, Hamish McInnes, and occasionally others. We made a new route on Mount Tutoko, and a first ascent of Mount Aspiring via the north side. We climbed Mount Cook in a first ascent of the north-northeast ridge. It was a rock ridge which we found in perfect condition on a perfect day; the climb to the summit took 12 hours. We descended the other side of the mountain, were overtaken by darkness at 10,000 feet, and spent the night on a small ledge from which we completed the descent on the following day. We had quite a scare on the descent when Peter slipped and slid 300 feet before stopping at the edge of a drop-off.

RICHARD K. IRVIN

THE NORTHERN SELKIRKS

THE NORTHERN SELKIRKS have had increasing attention lately from climbers attracted by their spectacular sound-rock summits. Almost all recent parties to go into the region have bushwhacked up Swan Creek from the Columbia; in August, 1955, however, George Arnis, Don Goodrich, Dick Irvin, Graham Matthews and his wife, Mary Ann "Corky" Matthews, David "Georgia" Michael, Mary Kay Pottinger, and Dave Rynin set out to reach the peaks from Flat Creek, on the railroad 50 miles to the south.

For a week the party wandered north, keeping as close to the crest of the range as possible in order to avoid the brush in the valleys. From Flat Creek the route led up to Bostock Summit, down to Tangier Creek, up to Tangier Pass, over a shoulder of Mount Sorcerer to Sorcerer Pass, up the Spastic Glacier to B-C Col, down to Batchelor Pass, up to Pyrite Ridge, along the ridge and down to Moberly Pass, up the Goat Glacier to Sir Sandford Pass, and down the Sir Sandford Glacier to base camp near the remnants of the once-great "Cairn." At Tangier Pass and on the Sir Sandford Glacier we picked up food and equipment that had been air-dropped for us earlier.

On the fourth day in camp, after several days of bad weather, Dick, Don, and Mary Kay climbed Sir Sandford (11,590), the highest peak in the Selkirks. Corky,

Graham, George, and Georgia went up The Footstool, a subsidiary summit. The fifth day the weather held for most of the day. Corky and Dave climbed Sir Sandford—reaching the top in a white-out and reaching the camp in a deluge. Don and Georgia attempted the southeast ridge of Big Blackfriar, but were put off by the change in the weather. Dick and Mary Kay managed to climb Silvertip by a new route, from the Silvertip-Redan Col. On the seventh day Graham and Georgia climbed Big Blackfriar by the east face (a new route); Corky, Dave, Dick, and Mary Kay went up the Gargoyle; and Don (for the second time) plus George climbed Sir Sandford. All our climbs of Sir Sandford were made by the "Michael Route." The eighth day gave more bad weather, but on the ninth day in camp Corky, Graham, George, and Georgia made a successful attempt on Palisade Mountain. The next day we started the hike to civilization. It took only five days to pack out. Possibly the thought of steaks and ice cream at the end of the line made us move a little faster.

DAVE RYNN

THE SOUTHERN SELKIRKS

AFTER making the long drive from Los Angeles to Revelstoke, B.C., climbers Worthie Doyle, Harvey Hickman, Barbara Lilley, and Victor Rutishauser (all of the Angeles Chapter) took the train to Glacier Park in the Selkirs August 14, 1955. We packed over the Illecillewaet Névé from the railroad town of Glacier, dropped into and crossed Glacier Circle, and climbed up on to the Deville Névé, bypassing the icefall by class-4 rock climbing on the wall which is to the far left of the icefall. We camped on the moraine of the Deville below Mount Fox, and were there for six days, with climbing weather on five days and a storm on the sixth. Ascents made were as follows:

Mount Augustine by a seldom-used route directly up the glacier from the Bishops Glacier, where it joins the Deville, to a saddle between Augustine and the peak to the south, then north along the ridge to the summit. We used crampons on the snow, and the rope occasionally on the summit rock ridge. We descended by the same route.

Beaver Overlook by an easy class-1 walk up its west snow slope. We enjoyed a fine view of the Purcells and the Battle Range.

Mount Fox via the conventional southeast arête. It was class-3 rock scrambling, three hours from camp. Descent was made on the west side directly to the Bishops Glacier (ice axes used).

Mount Wheeler by a snow route to the Wheeler-Kilpatrick Col and up the south ridge to the summit. It was class 3, and no difficulties were encountered. Descent was made via approximately the same route. Kilpatrick was climbed via its east face (a class-3 snow climb) in a dead heat with an oncoming storm that made ice axes buzz.

Grand Mountain via the shoulder of Mount Wheeler, a difficult bergschrund, and the east face to the summit ridge on snow, and from there by alternate class-3 and -4 rock and snow to the summit. Grand Mountain is noted for the unusual fact that the first peak you reach is the highest. We climbed high on the shoulder of Wheeler in order to find a better route over the bergschrund, then descended the south face of Wheeler back to the Deville.

We returned to Glacier over Donkin and Asulkan passes, where crampons were needed on the dirt and belays were sometimes used, and crossed the icy Incomappleux River.

BARBARA LILLEY

BUGABOOS VIA HORSETHIEF CREEK

EARLY in July, 1955, our group met at Lake Louise to make plans for a trip into the Bugaboos. We were to split into two parties, and one would drive to Horsethief Creek and make a long backpack northward over unexplored glaciers and unclimbed peaks. This traverse through the Taurus group had never before been completed. The other party was to continue the drive to Spillimacheen and meet us at Bugaboo Cabin four days later. While the planning was going on, some of the group climbed Mount Louis and Mount Edith.

On the morning of July 17 our car had reached its limit on the ruts beside Horsethief Creek, so we shouldered our packs and bade farewell to the ones who were to stay behind. We then made our way through the thick forest and underbrush, following a blaze here and a track there on what the Canadians call a trail. Toward mid-afternoon we came to a bridge that led us to the north side of the creek, and from there we were on our own. Several hours of crashing through the underbrush brought us to Stockdale Creek where we found a good game trail that made the going much easier.

The next morning we were faced with the problem of crossing the stream. We finally found a place where the stream split in two. There we built a bridge across both parts. We then ascended the North Fork of Stockdale Creek and looked for a pass to take us east to the glaciers and much easier going. On that evening of July 18, we camped in a high meadow on the west side of an unnamed peak, 9,800. Next day we ascended the unnamed peak and found that it was the first of many unclimbed summits we were to visit that day. We descended to the Catamount Glacier and left our packs for an attempt on a long, jagged row of five peaks called the Scotch Peak Group. Our party started at the northernmost of the peaks, which we named Scotch Tower. From the summit of the tower we traversed to Peak No. 1, and from there all of the ridge to Peak No. 4 with maximum class-4 climbing. At the end of the traverse, we ascended Mount Gwendolyn, and returned to our packs in the center of the glacier. We continued to the small lake above the west side of the Whirlpool Glacier.

The next day we made the long trek over Phacelia Pass and down into the valley of the South Fork of Bugaboo Creek. We arrived at Bugaboo Cabin in the late afternoon only to find that the others had not arrived. Finally one of them came in the door to say that the truck was stalled about four miles down the road, and that we would have to pack our gear. Two days later, on July 22, we had erected our tents at Boulder Camp in the shadow of Snowpatch Spire.

There were a few showers on the morning of July 23, but it cleared by ten o'clock. Hans Wehrli, a member of the Swiss Alpine Club, and I ascended Snowpatch Spire on the route listed in the guide to the Interior Ranges. We ascended Wilson's overhang with two pitons for protection, and from there climbing was uneventful until we reached the quartz vein. We ascended the vein pitch with three pitons for protection. That brought us to an exposed crack leading to our right, across a smooth face of granite. While placing a piton to cross the crack, I felt a good handhold above an overhang just over my head. After a pull-up, using this hold, I found a ledge which proved to be an easy walk to the summit. We had climbed Snowpatch Spire with nine pitons for protection. The climbing was comparable to that on the arête on Lower Brother in Yosemite.

The remaining days were marred by rainfall, but we split into small groups and attempted climbs despite the bad weather. On July 24, Bugaboo and Crescent spires were ascended, and on July 25, Eastpost Spire was climbed by a new route from Boulder Camp via the southeast ridge. Whippingpost Spire was also ascended, and finally a new route was made in a large couloir on the west face of Blue Lake Spire. This was a second ascent of the rottenest of the Bugaboos. On July 26, Crescent and Brenta spires were climbed. The next morning we began the pack-out to Bugaboo Cabin, and soon took the long, bumpy ride to civilization. MICHAEL P. SHERRICK

MORE BUGABOO CLIMBS

THE COMBINATION of central Canada's driest summer in living memory and the rehabilitation of the road to the Bugaboo forks made the Bugaboo area an even more appealing objective for climbers than usual during the summer of 1955. The road between Spillimacheen and the forks was passable to passenger cars, at least for the latter part of the season, thanks to the work of a uranium-mining outfit now operating at the forks.

Sierra Club and Stanford Alpine Club members Nancy Bickford, Bob Brooke, Dick Irvin, Tom McCormack, Mary Kay Pottinger, Gil Roberts, and Dave Rynin visited the region during early September, 1955. Members of the party climbed Snowpatch, Bugaboo, Pigeon, Marmolata, Blue Lake, Brenta, and Eastpost spires. Climbing was greatly facilitated by the absence of snow on the rocks; Pigeon Spire was ascended in 25 minutes instead of the one-and-a-half to three hours listed in the guide.

DAVE RYNIN

MOUNT BRUSSELS IN THE CANADIAN ROCKIES

IN AUGUST, 1955, Sully Cooper, John Ohrenschall, Mark Powell, and Merle Alley were camped at Athabaska Falls in the Canadian Rockies. Cooper and Ohrenschall were to drive to Mount Assiniboine with our only car. We two were to attempt the once-climbed Brussels Peak, which, from our campground, was quite impressive. We backpacked the 14 miles to camp below the north face of Brussels, using most of a day as we overlooked the bridge crossing where Fryatt Creek flows into the Athabaska.

The following morning only a few clouds were visible many miles to the west. We climbed to the Brussels-Christie Col by second- and third-class climbing beginning at a break in the wall to the east of Brussels. At approximately 9 A.M. we passed the site of the 1948 Lewis-Garner bivouac. Continuing west from the col the climbing is third-class on dangerous rock. We roped up at the base of a small step, and two more roped pitches led to the base of a large step, presumably the Garner Face. From this spot a pitch requiring two pitons for protection led up the left (south) corner of the face. The first ascent party apparently went up and to the right here. Our route intersected the first-ascent route at what appeared to be the base of the Lewis Crack. This is a 70-foot jam crack, nearly vertical in the middle part. A fifth-class piton, a few grunts and groans, and many minutes put Powell over the crux of the climb. It was maximum fifth class.

By now the clouds were no longer far in the distance. It was snowing slightly as we covered a good fourth-class pitch and then an easier one along the crumbly sum-

mit ridge. It was nearly 1 P.M. when we stood on the summit. We could see nothing through the snow flurries. We had a quick lunch and started for the col. Four rappels were set up on the descent. The third one, over the Garner Face, was approximately 130 feet, with a large block as rappel point. In spite of bad weather we completed the descent, the pack-out, and a hitch-hike to Banff.

We consider Brussels to be a technically difficult peak, comparable to some of the fifth-class routes in Yosemite Valley. Specifically, it may be compared to the right-hand traverse on the Lower Cathedral Spire. MERLE ALLEY AND MARK POWELL

SIERRA NEVADA

FIRST ASCENT OF CLYDE COULOIR, NORTH PALISADE

BY LATE summer the Clyde Couloir is a steep finger of dirty gray ice splitting the northeast cliffs of North Palisade. It appeared to offer an interesting pioneer route from the glacier to the notch between the mountain's two summits, so Dick Franklin agreed to attempt the ascent with me on September 4, 1955.

The certainty of rock falls made an early start advisable, and sunrise found us at the bergschrund. Amazingly, the crevasse was filled with snow, and thus the first anticipated obstacle vanished. The leader cut a few steps up the far wall to gain an improbable mushroom-like formation of ice. An ice piton guarded the next few feet, and the route traversed right onto the rock to avoid the ice lip above. We were soon back on the couloir's ice and icy rocks, which demanded caution but little skill. The only annoyance was an occasional unseen rock buzzing past; a deaf man would have enjoyed the climbing.

Finally, a low band of smooth rock crossed the gully and disappeared under the ice. I tried to cut steps, but the vertical face fractured in a frustrating undercut pattern. Squeezing between the ice and the rock, and a two-man stand, were equally ineffectual. I turned to pick up my ax, determined to cut up the outside of the bulge, when a broadside seemed to let go above. Dick crouched below a slight bulge of rock, while I timorously held the rucksack over my head. After the rocks passed, it was decided that our luck would not hold forever, so we thankfully took to the easy rocks beside the gully. A few pitches upward brought us to the regular route up the face.

JOHN D. MENDENHALL

NORTH FACE ROUTE ON MOUNT MILLS

MOUNT MILLS is easily accessible at the head of Fourth Recess, but has not been climbed frequently since the first ascent by Hutchinson, LeConte, and McDuffie in 1908. Their description of the route up the north face is ambiguous, and therefore we have thought it worth while to describe our climb of August 24, 1955. Under the north face there is a small, steep glacier, and above it are three rock ribs. When we climbed, there was evidence of much rock fall from the couloir between the eastern and central ribs. We chose the couloir between the central and western ribs and crossed the bergschrund on a snow bridge beneath it. The ascent was made partly up the snow of the couloir and partly up the western side of the central rib, until near the head of the couloir, where we worked to the right, more or less above the western rib. Ice axes and rope are necessary, and crampons advisable.

EDWIN AND STEPHEN ROPER

FIRST ASCENTS IN THE GORGE OF DESPAIR

THREE SEPARATE climbing trips were made into the Gorge of Despair in 1955, and a number of interesting first ascents were recorded. In June, Fred Martin, Kim Malville, and Robert Tambling made four first ascents. One was the highest point which they named "Tenderfoot Peak," on the north ridge of the gorge—a second-class climb. A third-class ascent was made of Fascination Turret, the lowest point on Crystal Spur below Frustration Turret. This point may be reached by ascending the wall north of the base of Frustration Turret from the notch. This party also climbed a remarkable needle-shaped gendarme immediately below Frustration Turret, a class-six climb. A high point on the ridge directly east of Fang Turret and Silver Turret proved to be a fourth-class ascent, and was named "The Python."

On July 8 a first ascent of a tower on Silver Spur was made by Felix Knauth, Harold Sipperly, and John Whitmer of the Loma Prieta Chapter. This tower, named "Friday's Folly," is a large wedge-shaped rock below and to the southwest of Silver Turret. The route follows an overlapping flake formation midway down the east side, and provides about 250 feet of high-angle fifth-class climbing.

Two members of the September group, James M. Carl and John Ohrenschild, made the first ascent of Hogback Peak (11,164) on September 10. The climb was made from the saddle just to the west, and was probably a class-two scramble.

The large turrets in the gorge, El Comandante, Crystal, Cobra, and Frustration, gave all climbing parties a good workout, and several new routes were found.

ROBERT L. SMITH

THIRD ASCENT OF LOST-ARROW CHIMNEY

THE Lost-Arrow Chimney in Yosemite was climbed for the third time on Labor Day, 1955, the eighth anniversary of its first ascent. The party, consisting of Jerry Gallwas, Don Wilson, and Chuck Wilts, was past the Second Error the first day and had reached the Wilts-Austin high point of 1947 by mid-morning of the second day. Although at this point they were only 300 feet from the notch, they did not reach it until noon of the third day. From the notch the climbers ascended the Arrow in four hours and were up the valley wall to Yosemite Point by sundown.

September is not the best time for ascending the Arrow, for the days are short, the nights long, and weather hot. Day temperatures were above 100° in Yosemite Valley during this period, the only blessing being warm nights.

Although there are four or five bivouac spots on the route, they are not conveniently spaced, and our party missed them all. Low spot of the trip was the second night, spent in a deep, narrow chimney, with Wilson and Wilts sitting back to back on a small chockstone, and Gallwas 20 feet above standing on chockstones where it was too narrow to sit. Throughout the night, the pair below was showered with sand and gravel every time Gallwas moved.

Contrary to popular impression, there is not much opportunity to use pitons extensively for direct aid except on two or three pitches. There is ample opportunity, however, to use every known chimney technique. A thin man in the party saves much time in climbing through the Harding Chimney. There is probably no shape of pack devisable that will not jam at least a dozen times in being hauled up the chimney. The first ascent took five days, the second four days, the third three days. Who's next?

CHARLES WILTS

VARIOUS YOSEMITE VALLEY CLIMBS

Sentinel Spire.—This spire is part of the Sentinel Rock massif—just east of Sentinel Rock. It was first climbed June 12, 1954, by George W. Whitmore and Warren J. Harding. The approach was made from Sentinel Dome by scrambling out along the crest of Sentinel Rock. A deep cleft separates the highest point of the crest from the lower north peak. From the top of the cleft a steep ledge was followed down to the east along the south wall of the cleft. Sentinel Spire rises about 80 feet above a notch at the lower end of this ledge. The climb was made up the west face of the spire to a prominent ledge. From here an exposed step led to the north face, and a crack behind a block to the east face. Halfway up the east face a flake was used to hold a class-5 sling. From this point a vertical groove leads to the summit; the first party considered it sixth class, but it has later been led without direct aid.

Arch Rock Pinnacle.—This pinnacle is on the north wall of Merced Canyon, about 1,500 feet above the Arch Rock Ranger Station. As seen from the Arch Rock parking lot, it terminates to the left of, and slightly below, the crest of the fractured granite outcropping that juts out from the canyon rim above. It was ascended for the first time on April 9, 1955, by Warren J. Harding and George W. Whitmore. The approach was made from the Coulterville road through light timber and burned-over areas to the canyon rim. From the most prominent point on the rim the pinnacle could be seen several hundred feet below. An easy descent was made to the notch separating the pinnacle from the main mass. Using a bolt anchor in the notch, a narrow gap was stemmed to permit access to a broad ledge on the pinnacle. At the far end of the ledge a flake was used to reach holds which eventually led to the summit in class-5 climbing.

FIRST ASCENT OF LOWER PHANTOM SPIRE

APPROXIMATELY two miles east of the town of Kyburz on Highway 50 are the spectacular Phantom Spires. They rise nearly perpendicularly from a ridge behind Fred's Place.

On October 13, 1955, Russell Hoopes and I made the third ascent of the higher Phantom Spire and then attempted the lower Phantom Spire. This 110-foot pinnacle, to my knowledge, had been attempted only twice; both attempts were failures. Unfortunately our attempt was the third to meet defeat on the spire. One week later, however, on October 22, Russ, Dick Sea, and I returned, determined to reach the top. We searched in vain to find a possible new route; it seemed that the west face offered our only chance. We chose a different type of attack, however. About 10 feet to the northeast of Phantom Spire rose a smaller pinnacle, named Mummy Spire, whose summit was only 30 feet lower than our objective. Fortunately, it was conveniently located almost on the opposite side of the west face.

I climbed Mummy Spire and on my eleventh attempt succeeded in tossing a cord over the top of Phantom Spire. During these efforts Russ had climbed to the spot we had reached the week before, 30 feet up the west wall. To reach this spot a rope was thrown over an outcropping rock and prusik technique was used. When Russ had reached this height he pulled down the line that I had thrown over to him. This line was attached to our climbing rope. He roped up, and from my position (on Mummy Spire) I gave him an upper belay. Russ then attempted the most difficult

part of the whole climb. Above and to the right of him was a vertical crack which offered few holds. He failed twice, but on the third try struggled past the defeating point which was a small bulge in the crack. He then climbed over a relatively easy broken area and reached the top. Dick and I followed, using prusik technique.

ROGER MOREAU

RECENT CLIMBS IN THE HIGH SIERRA

Riegelhuth Minaret.—An apparent first ascent of the east face was made by Lito Tejada-Flores and David Tonkin from the Sierra Club base camp at Minaret Lake on August 6, 1955. The climb followed the prominent diagonal gully in the middle of the face to the notch between the summit and a minor pinnacle, "Tiger's Tower." Difficulty varied from easy to severe class 4. About three hours of roped climbing was done on ten pitches.

Mount Winchell.—The north face was climbed August 14, 1955, by Robert Stebbins, Bill Rogers, and G. Ledyard Stebbins. They climbed easy ledges until above the top of the Winchell Glacier, and then ascended a series of cracks between the great northeast buttress cliff and a steep ice couloir until they reached the crest of the east ridge just below the east base of the summit cone. Class 4.

Mount Emerson.—An ascent of the southeast face was made in August, 1955, by Robert Stebbins and G. Ledyard Stebbins. They went up the left (southwest) of two cracks that lead up the face; these cracks are directly left of the couloir separating Mount Emerson from the Piute Crag, and can be reached by going about 1.7 miles up the Piute Pass trail from North Lake and then heading north. The left-hand crack or chimney was followed, with some deviations, to a ridge that led to the summit. This climb requires 2,500 feet of roped climbing, much of it class 4 on good rock, and it can be made in one day from the roadhead.

Mount Lyell.—A new route was climbed on July 19, 1955, by George W. Whitmore. From the head of Hutching Creek he climbed eastward to the col on the ridge running southwest from Lyell. The southwest ridge or arête was then followed until it merged with the upper part of the south face. Several hundred feet of high-angle climbing on sound rock led to the crest about 100 feet west of the main summit. Class 4.

Reviews

Edited by DAN L. THRAPP

THE SINGING WILDERNESS. By Sigurd F. Olson. Illustrations by Francis Lee Jaques. Alfred A. Knopf, New York, 1956. x + 246 pages. \$4.

In *The Singing Wilderness* Sigurd Olson, with sensitively chosen words, captures and brings to the pages of his book those subtle impressions which are the special contribution wilderness has for man. Sound and silence, light and shadow, warmth and cold, texture and color, fragrance and taste—all participate to reveal the meaning and quality of wilderness. This book has special meaning for the canoeist: "I have heard the singing in many places, but I seem to hear it best in the wilderness lake country of the Quetico-Superior, where travel is still by pack and canoe over the ancient trails of the Indians and Voyageurs."

This is then a book about canoeing in the finest sense and the white water man will perceive a kindred soul when he reads:

"Rapids, too, are a challenge. Dangerous though they may be, treacherous and always unpredictable, no one who has known the canoe trails of the north does not love their thunder and the rush of them. No man who has portaged around white water, studied the swirls, the smooth, slick sweeps and the V's that point the way above the breaks, has not wondered if he should try. Rapids can be run in larger craft . . . but it is in a canoe that one really feels the river and the power of it . . .

"When through skill or luck he has gone through the snags, the reaching rocks, and the lunging billows, he needs no other accolade but the joy that he has known."

The illustrations are exquisitely drawn and in perfect accord with the beautifully designed book. We are reminded of another delightful book concerning the Quetico-Superior called *Canoe Country*, by Florence Page Jaques, and also illustrated by Francis Lee Jaques, published in 1938 by the University of Minnesota.

BRUCE GRANT

TRAIL GUIDE TO THE SOUTH BOUNDARY COUNTRY, YOSEMITE NATIONAL PARK. By Lewis W. Clark. Stanford University Press, 1955. 48 pages, illustrated. \$1.85. **POCKET GUIDE** . . . (companion map), \$1.

These publications are the third and presumably final pair in the author's series of Yosemite guides; previous issues have described the High Sierra camps (1953) and northern Yosemite (1954). These new guides discuss the country south of the Merced River, including the south Yosemite Valley wall. Coverage extends from the west Park boundary to the Minarets and southward below Jackass Meadow and Devil's Postpile National Monument.

The *Trail Guide* begins with a brief, well-written introduction to the wooded country, meadows, and fauna of southern Yosemite; an over-all sketch map showing major roads, natural features, and trails; a section on good wilderness citizenship; and a tabulation of concessionaire services. The following sections present detailed sketch maps of each principal trail, accompanied by profiles (plots of elevations of selected points as a function of trail mileage) and brief descriptions. Trails covered are Wawona and Moraine meadows, Bridalveil and Alder creeks, Illilouette Basin

routes, Triple Divide area, south-rim trails to Glacier Point, and the Vernal-Nevada-Illilouette-falls triangle; side trails and connections are shown.

Subsequent sections deal with the Badger Pass winter-sports area and ski trails, the location and natural history of the sequoia groves, the former Indians of Yosemite, the Devil's Postpile, and the most common Yosemite birds. The concluding section is an effective explanation of the National Park System.

The Pocket Guide is a 21- by 27-inch, four-color sketch map (folded) of the entire area covered by the *Trail Guide*, intended for carrying on the trail. All major geological features are shown in simplified form, with exaggerated vertical scale, and all important trails and roads are indicated. On the reverse side, reprinted from the *Trail Guide*, are profiles and descriptions of principal trails; also included are sketch maps of the Badger Pass winter-sports area, Mariposa Grove, and Devil's Postpile.

VANCE GUDMUNDSEN

SNOW COVER AND CLIMATE IN THE SIERRA NEVADA, CALIFORNIA.

By David H. Miller. University of California Press, Berkeley and Los Angeles, 1955. 218 pages, 11 figures in text. \$3.

Although the Sierra Nevada is covered by a deep mantle of snow in winter, it has a singularly mild climate. The surprisingly warm days and moderate nights are widely known among California skiers and are remarked upon by newcomers, especially those familiar with the Appalachians. In the course of recent research on snow-melt runoff in the Sierra, Dr. Miller became interested in this anomaly and its apparent disagreement with the accepted theories on the climate of snow-covered regions. This book is the result of his studies on the subject and its principal theme is to explain why the Range of Light is also a Range of Warmth.

No one could be better equipped for the job. Dr. Miller is a distinguished geographer and climatologist who has done significant work for the Office of the Quartermaster General, U.S. Weather Bureau, and the Corps of Engineers. For several years he has engaged in research for the Coöperative Snow Investigations and its successor, Snow Investigations, a joint project of the Corps of Engineers and the Permafrost Research Establishment. These studies have been centered at the Sierra Snow Laboratory on Castle Creek, north of Soda Springs, a locality familiar to all Bay-area Sierra Club skiers.

The book is Volume 11 of the University of California Publications in Geography, and is a competent, meticulously documented work. It is divided into chapters dealing with thermal characteristics of the Sierra, upper-air circulation, the role of forests in local climate, physics of the snow cover, and the total heat economy of the Sierra crest region. There is an appendix containing a description of the topography and areal distribution of climatic elements in the Sierra, and an exhaustive bibliography. Numerous figures and tables are scattered through the text.

The reader cannot but be impressed with the enormous amount of material gathered together, and Dr. Miller's masterly handling of the difficult and complicated subject of heat exchange between the atmosphere and the earth's surface. In fact, this study is probably the first important advance in theories concerning the climate of snow-covered regions since those of the Russian Voeikov in the 1880's.

But this is not a book for the layman. Unless he is a trained geographer and climatologist the reader is apt to flounder hopelessly before he arrives at Dr. Miller's conclusions. Then perhaps he is little better off. For, summing up on page 184, the

author writes that the comparative warmth of the Sierra Nevada "is the result of two interrelated features of the circulation of the upper air; the position of the rim of the circumpolar vortex; and the frequent occurrence of anticyclonic curvature of the streamlines, with consequent subsidence and transparency of the air to short-wave radiation. The air is not similarly transparent to long-wave radiation, because of a blanket of vapor that arises from snow and trees in the concave parts of the region."

But the layman skier can continue to enjoy the delightful Sierra winter weather and be glad that Dr. Miller has found a scientific reason for it. WELDON F. HEALD

THE CONQUEST OF MOUNT MCKINLEY. By Belmore Browne. Houghton Mifflin Co., Boston, 1956. 381 pages, 41 photographs. \$6.

Among the international characters of the first half of this century none is more enigmatic than Dr. Frederick A. Cook. An able explorer who wound up in Leavenworth for a phony stock deal, his claims during intervening years have intrigued two generations. But not only run-of-the-mill bystanders were fooled—he puzzled the experts, as well. Roald Amundsen, perhaps the greatest polar traveler of them all, so believed in Cook that he was willing to visit him in prison and risked his own lofty reputation in doing so. But Peary, Stefansson, and other explorers regarded him as a mountebank.

Most notoriety, of course, attended Cook's claim to have reached the North Pole a year ahead of Peary. But two years before that he had claimed to be first to climb Mount McKinley.

Belmore Browne, in several expeditions, proved photographically that whatever Cook's other claims to fame, he never climbed McKinley. This book, newly reprinted as a classic of American mountaineering, is the story of the gathering of the evidence.

The book is also a stirring chronicle of mountaineering and a tribute to the hardihood and resourcefulness of the men of the North. They used no porters, hired no guides; whatever they accomplished was the result of their own unaided effort. Browne's account of his three attempts to reach the summit of Mount McKinley (in 1906, 1910, and 1912) is presented in a factual, easy-to-read style that brings alive to the reader these adventures of a bygone day. Many excellent photographs by Bradford Washburn and the author are scattered throughout the text.

The 1906 expedition started in May at Cook Inlet, 140 miles south of Mount McKinley. Food ran short, and the terrain proved more difficult than expected, so the attempt was abandoned without finding a suitable approach to Mount McKinley from the south.

Results of the 1906 expedition made an approach from the southeast appear to have the best chance of success. In May, 1910, Browne's group went by boat up the Susitna and Chulitna rivers to a point about 37 miles from McKinley. Here the ascent of the Ruth Glacier began. Food and equipment were moved by a relay system, each of the eight men making two trips a day between camps, carrying loads of 80 pounds and more. Light-weight, dehydrated foods were unknown at this time. Their diet consisted of pemmican, hardtack, tea, erbswurst, sugar, and raisins. This trip also failed its goal, but established that an approach to the mountain from the south was not feasible.

Disappointment with horses and boats as modes of transportation resulted in the 1912 expedition—a winter trip in which dogsleds were used. Starting from Seward,

the sleds crossed steep passes, newly frozen rivers, and barren wasteland. After many exciting adventures, the Alaskan Range was crossed east of McKinley, and the mountain was approached from the north. In spite of steep pitches and a heavily crevassed glacier, Browne and his companions found it possible to take their dog team up to 11,000 feet. From this elevation, the perfected relay system was used to place a final camp at 16,615 feet. Two attempts were made to reach the summit, but nausea induced by poor diet and the extreme cold prevented success by a hairbreadth.

PHILIP A. LYDON

ABODE OF SNOW: A History of Himalayan Exploration and Mountaineering. By Kenneth Mason. E. P. Dutton & Co., New York, 1955. 372 pages, 21 photographs, 16 maps. \$6.50.

This excellent book fills the need for accurate information on the early travelers, explorers, and surveyors in the Himalayas. The author adequately covers the important mountaineering expeditions (up to and including the first ascent of Everest), yet this phase of Himalayan history is not his best contribution. The author's qualifications are reflected in the accurate and first-hand style with which he covers early explorers, surveys, geography, weather and political conditions as they affect mountaineering in the Himalayas.

Mason was in the Survey of India for 25 years and spent most of that time in northern India and in the Himalayas. Later he was professor of geography at Oxford for 21 years and a member of the Mount Everest Committee for 6 years.

Useful for anyone studying a particular area are Mason's comments on the reliability of various maps and surveys. Appendix "A" lists the 50 highest Himalayan and Karakorum peaks and appendix "B" discusses an interesting point "On the Determination of Himalayan Heights."

Footnotes guide the reader to fuller information and to the source of some of Mason's facts. A short bibliography and an index are also useful. MUIR DAWSON

THE MARCHING WIND. By Leonard Clark. Funk & Wagnalls, 1954. 369 pages, illustrated. \$5.

This is explorer Clark's third book—the account of a daring journey taken in 1949 to the headwaters of the Yellow River on the high, mountainous plateau between China and Tibet. The chief purpose of the expedition was to find and measure the height of Amne Machin, Asia's fabulous mystery peak, which, according to persistent rumors for the past quarter century, may be the highest mountain in the world. It is a lively book, packed with action, adventure, hardships, and danger, dashes of Buddhist and Mohammedan philosophy, and dissertations on central Asian politics. The publisher's blurb says: "Here is adventure at its best, absorbing and full of vigorous excitement." As far as the book as a whole is concerned, we'll leave it at that. But what is particularly interesting to mountaineers is that Clark was completely successful. Although constantly threatened by slow torture and sudden death at the hands of the savage Ngolok tribes, he penetrated to the very foot of Amne Machin with a few native companions. There he measured its height: 29,661 feet—633 feet higher than Mount Everest!* He then headed for home, turned his data and photo-

*The altitude of Mount Everest is 29,028 feet, according to a recent report of the Survey of India.

graphs over to the U.S. Geological Survey and *Life* magazine—and found that nobody believed him.

Clark is quite hurt and bitter about the general skepticism toward his remarkable achievement. Never for a moment does he appear to realize that the trouble lies with the writer. For seldom has a more vague, confusing, contradictory, sketchy, and unconvincing account been offered to the public as a serious attempt to present accurate geographical facts.

Faith in the book's scientific accuracy is first weakened by the use throughout of an incorrect meters-to-feet conversion factor of slightly more than 3.05 instead of 3.28. But it is upon the approach to Amne Machin itself that the baffled reader stumbles blindly about trying to follow Clark's hurrying, enthusiastic figure. Finally, one begins to wonder which is the more mercurial, the author or the mountain.

Triangulation of the southernmost point of the summit was made on May 6, from a carefully measured 1,000-meter base line, five miles from the northwest base of the peak. The altitude of the triangulation station is given on page xiv as 3,850 to 3,870 meters, by altimeter and boiling-point thermometer; and on page 182 as 15,300 feet (4,664 meters), according to Chinese military maps, checked by instruments on the spot.

From this unstable point, with its unusual altitudinal fluctuation of some 2,700 feet, Clark writes: "Amne Machin Peak lay at a great distance *back of two big foundation piles* (or piers) on this western side, and appeared to be separated widely from the great upsweeping massif—though this seemed highly improbable—by canyons, more likely by a deep saddle-connection." After digesting this, we learn that "A wide shallow rift, or glaciated valley, strikes at an upward slant straight eastward along Amne Machin's north flank," and further, that "Amne Machin's mountain mass was covered over with snow and ice brushed smooth by high winds, from its base in the 15,000-foot level to its ridge or domelike peak. . . . Only the thin dark edges of stony ridges running upwards toward the culminating peak were clear of snow and ice. This appeared very thin in the lower regions, but deep at the summit."

And this is every bit Mr. Clark has to offer in the way of a description of the "highest mountain in the world," after traveling thousands of miles, braving countless dangers, and traversing some of Asia's most inhospitable country. Although the author tells of photographing the mountain, there is but one unsatisfactory picture taken at the base, with the vague explanation that "the main peak lies behind the long ridge." One must take his word for this, for it certainly isn't obvious. The book contains no detailed sketch map of Amne Machin and immediate vicinity; no clear and succinct description of its slopes, valleys, ridges, and faces; and such important features as height of snowline, and the extent, size, number and length of glaciers are completely omitted. Even a touch of geology with the general structure and rocks of the mountain would have helped, but it is still a secret, apparently locked in Asia's bosom.

WELDON F. HEALD

THE MOUNTAINS OF NEW ZEALAND. By Rodney Hewitt and Mavis Davidson. A. H. & A. W. Reed, Wellington, 1954. 129 pages, illustrated, photographs and maps. 18s 6d.

Not one American climber in a hundred knows anything about New Zealand's mountains and yet here is some of the grandest climbing on earth—climbing that produced, for instance, the first conqueror of Everest.

As this lavishly illustrated book attests, nowhere in the world is there more gorgeous mountain scenery, offering more diverse sport, and better sport, than in South Island. But North Island isn't far behind. And all of it unfenced, much of it little known, some of it never climbed or tracked by skis. Not only that, but it is all at a lower altitude than the Himalayas, more readily accessible for geographical and political reasons, and no more costly to reach.

D. L. T.

CALIFORNIA GRIZZLY. By Tracy I. Storer and Lloyd P. Tevis, Jr., University of California Press, Berkeley and Los Angeles, 1955. 335 pages, 37 illustrations, two in color. \$7.50.

Here is a book no one interested in California wildlife, history, folklore or literature can afford to pass up. The writers have done a fine job assembling and presenting their material. They have overlooked no angle in their study of this greatest of California carnivores, now unhappily extinct. However, despite the able efforts of the authors, the study, it seems to me, fails to present a clear picture of the grizzly as he must have appeared to Californians of the past. And this is because there were no naturalists, accomplished in the present-day sense, to study him before he passed forever from view. What one wouldn't give to read a chapter prepared by some nineteenth-century Murie or Thompson Seton.

Yet because the grizzly was never competently studied while he existed, we must be grateful to Storer and Tevis for this volume. They tell all that could with diligence be dug up about this great creature, and they tell it well.

The book is divided into a dozen chapters dealing with the record of the bears in the state, physical features, habits, the historical record, and so on.

Many will find the sections relating to grizzlies and the Indians, Spaniards, and Yankees most interesting. In the part about bear-and-bull fights, the writers have chronicled a cruel, sometimes depraved, side of our past that we have no business forgetting. The pages on that fabulous and all but unknown character, Grizzly Adams, are worth a book in themselves. Adams not only captured mammoth grizzlies alive, but trained them to carry packs and help him hunt down and kill other grizzlies. He received fearful blows from them and booted them in return, and lived out his short, battered life as half bear, half human, and all man.

One puts down this book with a melancholy feeling that it chronicles a lost conservation battle that should have been won.

D. L. T.

THOSE OF THE FOREST. By Wallace Byron Grange. Line drawings by Olaus Murie. The Flambeau Publishing Co., Babcock, Wis., 1953. 314 pages. \$4.75.

With a glade in the forest as background the author takes his readers through a vivid two-year cycle with nature, all seen through the eyes of Snowshoe the rabbit and his offspring Lepus. It is an intimate experience with life and death. The wilderness birth and struggle for existence is watched also through the philosophical mind of the author who propounds unanswerable and eternal questions.

As the seasons roll from winter through spring, into autumn, and back to the close of the cycle, all nature changes under the graphic pen of the author. It is a fascinating study and a thought-provoking treatise. It is at once beautiful and tender, harsh and cruel.

KATHERINE M. SMITH

BIRDS OF THE WORLD: THEIR LIFE AND HABITS. By Paul Barruel. Translated by Phyllis Barclay-Smith. Oxford University Press, New York, 1954. 204 pages; reproductions of paintings, photographs, and line drawings; bibliography, index. \$12.50.

The illustrations are splendid and there are more than two hundred of them, including sixteen pages in stunning color. The book is handsome. Though the title is inexact, for M. Barruel takes up only some representative birds, the text is a fine product of French scholarship with its universality in point of view. The author cites birds from all continents and oceans, without disproportionate emphasis on European birds, and his approach is both comprehensive and functional.

The translator gives the British and American common names for a bird whenever national usage differs. There is a minimum of technical terminology in this thoroughly interesting book.

RICHARD G. LILLARD

ALASKA RECREATION SURVEY: Part II, Vol. 2. A Recreation Program for Alaska. National Park Service in cooperation with the territory. U.S. Government Printing Office, 1955. 147 pages, illustrated, charts and map.

This is the latest publication of the Alaska Recreation Survey, an activity of the National Park Service in cooperation with the territorial government. The report consists of 102 pages which were multilithed from typewritten copy, and a rear-pocket map of the "Preliminary Inventory of Areas." Numerous photographs, reproduced by multilith process, add attractiveness and interest.

After reviewing the present status of recreational resources and needs of Alaska, the report proceeds to describe in specific terms the steps which should be taken to put a recreational program into effect. The basic need is for legislation to set up an operating park and recreation program in the territory and to sell or lease federal lands to the territory for park purposes. Establishment of a Park and Recreation staff, selection and development of areas, and cooperative work with the federal government could then proceed.

Two-thirds of the publication is devoted to a "Preliminary Inventory of Areas" which will be useful in setting up a working program. "This inventory could be used as a guide toward arriving at a practical choice of places with which to begin, as well as a means of arousing public interest on the part of the people of Alaska in the recreation subject generally."

For each of 147 areas along existing and projected highways, and elsewhere, a brief description of the recreational assets is given together with recommendations for development for public use. This inventory of Alaska is unique. Even though "preliminary" in nature, it is valuable for planning purposes and should stimulate public interest in the subject.

The authors of this report—anonymous officials of the National Park Service and the territorial government—are to be complimented for producing a valuable and thought-provoking document. This reviewer believes that it will come to be regarded in future years as a milestone on the road to proper use of the vast recreational land resources of Alaska.

VICTOR H. CAHALANE

ARCTIC WILDERNESS. By Robert Marshall. Edited, with an introduction by George Marshall; foreword by A. Starker Leopold. University of California Press,

Berkeley and Los Angeles, 1956. 171 pages, illustrated, maps and photographs. \$3.75.

Bob Marshall needs no introduction to those imbued with the wilderness idea; in fact, he did a good deal of the imbuing himself. Although he died at 38, he had made the ounces of his weight felt across the land and, through such books as this, his influence will continue for years to come.

Marshall was a leader among those urging conservation of our natural resources, but he was more than that. In large measure he was responsible for the wide acceptance of the "wilderness viewpoint," if there be such today. At least he made many people aware of wilderness values who previously had not thought much about them.

He was a technical forester, held federal positions as such, but his importance to us is that he generated enthusiasm toward preservation of large blocks of wilderness for the enjoyment of later eras.

This book is a well-edited selection of Marshall's records of his trips by foot, boat, and dogsled into wilderness areas north of the Arctic Circle, mostly in the Brooks Range north of the Yukon. It is based on newly discovered papers, according to the editor, but is smoothly wrapped up so that the illusion Bob Marshall wrote it for publication as a book is complete.

As such it is pure narrative, but it is also of historical interest, as Starker Leopold points out in his brief foreword. For when Marshall explored the Brooks Range, he could not know that within a few years there would be a working oil field to the north and that shuttling airplanes would make almost every part of the wild mountains well known, at least in outline.

But this detracts not a bit from his enthusiastic acceptance of a near-tragic boat mishap as a welcome adventure, or the good-natured grouching with which he faced the black clouds of mosquitoes for which that country is known.

All in all, reading this book is as fine an adventure as Bob Marshall had twenty years ago when he was gathering the makings of it.

D. L. T.

THE NATION LOOKS AT ITS RESOURCES: A Report of the Mid-Century Conference on Resources for the Future. Edited by Henry Jarrett and others. Resources for the Future, Inc., Washington, D.C. 418 pages. \$5.

This report on the Mid-Century Conference on Resources for the Future, held in Washington, D.C., in 1953, is an interesting and informative history of the sincere efforts of responsible citizens to insure that some of our heritage may be properly handled for at least the next 25 years.

The rate of use of material resources in the past is measurable. Future use can therefore be predicted and management criteria can be established for resources such as water, forest products, and nonfuel minerals. The problem of energy resources is more conjectural, but it too can be calculated.

Little coordinated planning has been done in the past for the intangibles of wildlife, scenic and recreational areas, and wilderness. It is plain from this report that unless something is done soon, these resources may be so exploited that little will be available for the expanding recreational needs of an increasing population. Thus a complete study by all interested agencies, such as the Scenic Resources Review proposed by the Sierra Club, is not only timely but absolutely necessary.

RUTH AIKEN

OUR WILDLIFE LEGACY. By Durward L. Allen. Funk & Wagnalls, New York, 1954. 422 pages, 26 photographs. \$5.

This is a masterly review of the whole subject of wildlife by an acknowledged leader in that field. Allen is biologist for the U.S. Fish and Wildlife Service and has a national reputation. His book will certainly become indispensable to anyone who loves or studies the outdoors—a pilot peak of wildlife literature from which all the country can be surveyed and new routes projected. Allen writes clearly and attractively, with a happy knack of phrasing. “A quail is a better judge of quail habitat than either a hunter or a biologist . . .” illustrates both his style and the main theme of his book which drives home the necessity of working with nature if we would keep the wildlife which civilization has still left us.

Each chapter deals with a particular foundation stone of successful wildlife management, and each point is clinched by examples from all over the world. The influence of good soil is described, and the tremendous reproductive potential which will work for us if only the habitat is right. We read of the six deer which were enclosed on 1,200 acres and grew to 160 in five years. But winter feed (or summer drought) and shelter which will allow only just so many individuals to survive, are nature's own controls.

Our efforts to add more individuals, via game farm or hatchery, fail unless we lift these controls, and we might just as well hunt and remove those animals which are surplus. There are factors still unknown, of fertility and disease, which cause the extraordinary “boom and bust” in wildlife populations. Allen cites the Canadian snowshoe rabbit so abundant at the peak of the cycle that the house cat was bringing home twenty a day, and then the sudden drop which left hundreds of lynxes to starve. In the Great Lakes the catch of smelt reached four million pounds in 1941, only to drop to 10 per cent of that within one year. The chapter on predators is especially interesting, well summed up in the title “We thought we knew about predation, but in reality we only felt.” There is a section on biopolitics which is an excellent study of the narrow path the biologist must walk between his science and his public. The reference notes are highly interesting and should be read with the text. There are 500 items listed in the bibliography, surely an indication of the extensive study which went into the writing of this book.

The author is above all a conservationist in the best sense. The outdoors is a way of life for him, a constant inspiration for his own living, and he understands the pressures on the wilderness. “Where are we to hunt and fish, or just be alone?” We are lucky to have a man of such devotion, and such mature and comprehensive outlook, in our national service.

CICELY M. CHRISTY

LAND AND WATER TRAILS. By Ellsworth Jaeger. Macmillan, New York, 1953. 227 pages, illustrated. \$2.95.

Ellsworth Jaeger, widely known lecturer and writer on outdoor subjects, is now curator of education at the Buffalo Museum of Science. He knows the wilderness areas of Canada, the United States, and Mexico, and has spent years among various Indian tribes from whom he has learned much about camping out and traveling in wild places.

In this book he instructs the water traveler in the basic methods of paddling, tricks of running rapids, and ways to construct emergency craft. In addition there are instructions for building and handling many types of boats, with detailed illustrations

drawn by the author. The land traveler is told how to ride and care for horses and burros. Both hiker and camper learn many useful things about ropes and knots—even how to tie a bowline, although not how to climb rocks. The chapters on wilderness “critters” can contribute much to the hiker's enjoyment and understanding of the forest and its inhabitants. Comprehensive and practical suggestions are offered for combating animal and insect pests.

Jaeger concludes with a plea for protection and conservation of tomorrow's wilderness, for as he says, “The out-of-doors is the natural way of life for mankind. Such is man's birthright, and he must return to it from time to time to renew his strength, to wash away the grime of artificial urban living.”

JOAN D. CLARK

VEGETATION AND WATERSHED MANAGEMENT. By E. A. Colman. Foreword by Fairfield Osborn. Ronald Press, New York, 1953. 412 pages, 37 photographs, 6 maps, diagrams. \$7.

This Conservation Foundation study was written by the chief of the Division of Forest Influences Research, in charge of watershed management in wildland areas of California for the federal Forest Service. It is a timely book. It appears at that stage of our national development when serious attention is being given to the problem of whether our population and industrialization are outrunning our natural water supplies.

The volume is a comprehensive survey, as Dr. Osborn notes, of the control, by vegetative means, of water on the land, beginning at the point where precipitation strikes the foliage, and ending with the influence of management practices on runoff and ground-water storage. It is a technical work, written in nontechnical terms, readily understandable by the interested layman. It will become a basic work for those concerned with this increasingly vital component of our national well-being.

D. L. T.

AMERICAN GAME BIRDS OF FIELD AND FOREST—Their Habits, Ecology and Management. By Frank C. Edminster. Scribner, New York, 1954. 490 pages, illustrated. \$12.50.

Dr. Edminster, a veteran wildlife biologist now with the U.S. Soil Conservation Service, presents in this volume what is known about the life history and management of almost every upland game bird in the United States—the pheasant, turkey, pigeon, woodcock, and various grouse, quails, partridges, and doves. He treats each species more from the point of view of the population than the individual, following the birds through the seasons, describing their courtship, giving the details of their nesting requirements, telling of the vicissitudes which may befall the young birds—the impact of the hunting season and the pinch of winter. For each species there is a life-equation table which takes the population through one year, showing the original population, their reproductive gain, and the manner in which this is whittled away as the seasons pass.

The author has a close feeling for the land, and a keen appreciation of the ways in which man affects, through the things he does to the land, the livelihood of these birds. He clearly shows for species after species that man's control of the habitat is the key to the abundance or decline of the population. Heavy hunting, for example, can be readily tolerated by most species if the habitat is adequate; only for the dove, pigeon, and woodcock, in which the reproductive potential is low, is the control of hunting pressure the most important management tool.

In his zeal for good land management, Dr. Edminster is inclined to imply that what is good for the soil is good for game. This is true, of course, in the sense that if the soil goes, everything that depends upon it goes too. But soil can be well managed and still support no wild birds or mammals at all. As a nation, we are being forced to take better care of our soil, but we should not delude ourselves into thinking that this care will lead automatically to wildlife abundance. Rather, we should return to the body of evidence which the author has compiled—evidence which shows not only how closely these birds are dependent upon their habitat, but also how the habitat can be modified deliberately for their welfare.

RICHARD D. TABER

FORERUNNERS TO EVEREST. By René Dittert, Gabriel Chevally, and Raymond Lambert. Harper, New York, 256 pages, illustrated. \$4.

This book gives a detailed account of the two Swiss expeditions to Everest in 1952. As the title implies, these parties helped find the way for the successful British expedition in 1953. The Swiss were beaten by bad weather and poor oxygen equipment, but their attempt was heroic and the book is a fine one.

In the spring of 1952 the Swiss worked their way up through the great icefall of the Khumbu Glacier and established an advanced base camp at 21,162 feet in the Western Cwm. They then forced a route up the steep slopes to the South Col at 25,850 feet. From there, on May 27–28 Lambert and Tenzing made a desperate attack on the summit. After a night at 27,500 in a tent without sleeping bags or stove they went on to 28,200, their highest point, and barely had energy left to return.

In the fall a new expedition set out with the hope of finding steady fair weather. Skies were clear, but the winds were tremendous. After many struggles the South Col was again reached, though one Sherpa was killed by falling ice. From the Col on November 20, Lambert, Reiss, Tenzing, and six Sherpas set out to establish a high camp. They reached 26,600 ft.; cold and wind made further advance impossible.

The Swiss story is a fine complement to Hunt's *The Ascent of Everest*. The style of the Swiss book is less formal; most of it is in diary form, and enlivened by much conversation. Hopes, fears, disputes, troubles, joys, and disillusionment are all set forth, together with many philosophical comments. Dittert's part of the book, the record of the spring attempt, is especially warm and human. The accounts of both expeditions describe Lambert and Tenzing as outstanding high-altitude climbers, and their two names will stay on the honor roll of Everest climbers. Readers who have followed the epic of Everest will wish to read of their activities and those of their companions in *Forerunners to Everest*.

HERVEY VOGE

THE AGE OF MOUNTAINEERING. By James Ramsey Ullman. J. B. Lippincott, Philadelphia, 1954. 352 pages, 24 pages of illustrations, 6 maps and sketches. \$6.

Ullman has successfully completed the task of bringing his history of climbing up to date since his earlier volume, *High Conquest*, appeared in 1941. The present volume, detailed and comprehensive, includes the material of the earlier book plus the major ascents and failures that have occurred since, and the whole makes for great reading. The scope is world-wide, with the focus, as it should be, on the Himalayas, including accounts of Annapurna, Kangchenjunga, Nanga Parbat, K2, and Everest. Ullman does a remarkable job of making the reader feel a part of these ascents, to rub elbows with Hillary and Tenzing on the summit of Everest and to accompany Buhl on his solo climb on Nanga Parbat.

Ullman is at his best when he is objective; not so when he is subjective, as judged by his comment on the disasters on Nanga Parbat: "And while feeling sorrow for the brave individuals who lost their lives, one cannot but feel that collectively they met a fate that was not undeserved." Also, he ascribes the 300 to 400-a-year casualty lists in the Alps to competition by the lunatic "experts," which is only part of the answer; he ignores the untrained beginners who make up much of the total. He takes a dim view of "rock engineers," which I cannot ignore. Rock engineers, after all, respond to a challenge, test their capabilities to the utmost and enjoy momentous adventure with doubt as to the outcome. Sounds like mountaineering by Ullman's own definition.

Minor errors tend to detract from this scholarly work: Mount Waddington was not the scene of the 1947 fatality; it was Mount Serra. The North Peak of Mount McKinley is not 300 feet lower than the main South Peak; it is closer to 800 feet lower. The Sourdough expedition did not climb the North Peak from the 10,800-foot glacier camp in one day; they had a 16,000-foot camp. Nanda Devi was not climbed by the north ridge; it was the south ridge. Bauer's 1931 Kangchenjunga expedition did not reach 26,220 feet; they reached the summit of the Northeast Spur, 7,700 meters, or 25,250 feet. As described in the reading list, Nanda Devi does not "remain today the highest mountain ever climbed to the top."

FRITZ LIFFMANN

A CLIMBER'S GUIDE TO THE TETON RANGE. By Leigh Ortenburger. Sierra Club, San Francisco, 1956. xii - 160 pages. Illustrated with drawings by Eldon N. Dye and 25 photographs. \$3.00.

Whether by design or accident, this book is much more than a climber's guide. Most of us expect to find in a regional climbing guide a kind of cook book which presents climbing routes in recipe form. Ortenburger's contribution goes much further. The book is a surprisingly complete history of climbing in the Teton range, with valuable references to the general literature of American mountaineering. It takes on literary value in the Editor's Preface, from which the reader may derive some valuable insights into climbing and climbers. A geological appendix by Roald Fryxell provides a fine introduction to the geology of alpine terrain, and to the geology of the Tetons in particular. And incidentally, this is a climber's recipe book as well. In each of these aspects the book is well done, skillfully arranged and *beautifully* illustrated with photos and drawings.

But what of the book as a climber's guide? I will admit that a climbing guide (as distinct from a reference book) has some value, but I am somewhat reluctant to do so. Route finding is an integral part of the sport. If a guidebook is designed to remove or to minimize this phase it will likely fail, and perform a disservice in the process. For this purpose I suggest a guide rather than a guidebook. At the same time, however, thorough reconnaissance (including advance information about routes and obstacles) is part of the sport, serving in the interest of success and safety. Source books and articles are of value in this reconnaissance. But what is the value of a guidebook, to be carried on the climb? What can it do that prior study and a good map will not do? It *can* be employed as a crutch in lieu of reconnaissance in hastily conceived climbing plans. We have all seen the humor in the picture of a climber with an opened guidebook in one hand, probing for the route with the other. As technique this is more frightening than humorous. With these qualifications, then, I will admit the value of a guidebook in introducing new climbers to new regions.

Route descriptions should be restricted to important identifying terrain features, crucial "choice points" and major obstacles. Ortenburger's book meets this criterion quite well, yet there are some instances of excessive detail. For example, the Exum Ridge on the Grand Teton is described with great care, including many variations upon variations. This is the most popular route in the range and detail might be thought justified on this ground. However, the new climber will need direction getting *onto* this ridge, not *up* the ridge. In the course of nine summers I have conferred with hundreds of climbers trying this ridge for the first time. Many of these parties have failed to locate the ridge, or the route of access to it. No one, to my knowledge, has failed in route finding after gaining the ridge. It is more difficult to get off of it than up it. What is the value, then, of a detailed catalogue of the many variations possible? I say it is of no value to the new climber in his first ascent, but it is of interest to the old climber on his fourth, fifth or *n*th ascent. It is of value as a reference, not as a guide.

A guide for the new climber in a new range should describe the major routes on the major peaks — routes which have become classical and attract attention. This book is exhaustive. Nineteen routes on the Grand are described. Many of these have been climbed only once and will never become well traveled. (The Wittich Crack was, I believe, the second route on the Grand and has never been repeated). Every summit in the range is treated, a large number having no name and identified only as a triangulation point. Unless I am mistaken, some of these were climbed first by early survey parties, and second by Ortenburger in research for this book. Again, it is more valuable as a reference than as a guide.

While route descriptions may help the newcomer find his way, a grading system of difficulty should help him anticipate mountaineering problems. The grading system advanced by Ortenburger can best be understood by translating it, with some loss, into a familiar system, or through prior knowledge of Teton climbs. Thus, it is the newcomer who is left out. This new one was devised in response to shortcomings in other systems and I feel it can be of value, but only to climbers who know this range and can converse using Teton climbs as models. This, of course, is a severe limitation.

A person buying this book as a climbing guide is getting more for his money than he might suspect. While it will serve as a guide it has its major value as part of our climbing literature. The thoughtful reader will, I believe, derive more from the Editor's Preface than from specific route descriptions. I have only one strong regret — that this book was not explicitly planned and written as a climbing history or a climber's source book. Whether another edition or another book provides this, the Teton Range deserves it.

RICHARD M. EMERSON

A CLIMBER'S GUIDE TO PINNACLES NATIONAL MONUMENT

This guide, by David Hammack, was published by the Sierra Club in 1955. It contains 14 pages of text, a two-page map, four photographs, and two decorative drawings; it is available from the club office for 50 cents. Climbers who visit the area will wish to read of the many ascents that have already been made, some of them quite spectacular. They will also enjoy the names that have been given to the rocks of the Pinnacles area, whose rounded shapes often resemble modern sculpture—names like The Torso, The Egg, The Hatchet, The Heffalump, Tuff Dome, Long's Folly, and others. Dave Hammack has done a careful job of collecting information on routes in this popular area.

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